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THE RÔLE OF MONILIA PSILOSIS (ASHFORDI) IN EXPERIMENTAL SPRUE

INCLUDING MYCOLOGIC OBSERVATIONS ON TWENTY-ONE STRAINS OF MONILIA *

LAWRENCE WELD SMITH, M.D.

BOSTON

The studies of experimental sprue presented here were initiated as the result of finding *Monilia psilosis* in certain fatal cases of anemia in Manila, which were associated with the clinical picture of sprue.[1] The lack of accord as to the specific nature of the disease seemed of sufficient importance to attempt to confirm the painstaking work of Ashford [2] in Porto Rico by using strains of *Monilia* obtained from an entirely different locality.

By way of introduction, a brief review of the literature may serve to bring to mind the outstanding features of the disease both clinically and from the laboratory point of view. The definition of the disease which has become almost classical is that found in the successive editions of Manson's Tropical Diseases.[3] There it is described as "an insidious, chronic, remitting, catarrhal inflammation of all or part of the mucous membrane of the alimentary canal, occurring particularly in Europeans who are residing or have resided in tropical or subtropical climates." Ashford [2] has succintly defined it as "a chronic disease characterized by a sore and beefy tongue, a gaseous bowel, a small liver, a pale, foamy voluminous diarrhea, wasting and anemia."

The first description of the disease dates back to 1766, when Hillary [4] first reported its presence in the West Indies. It has gone by various names, the most common of which are: aphthae tropica, diarrhea alba, white flux, Ceylon sore mouth, psilosis linguae and sprew, the latter term being the Dutch name, which has been generally adopted by English writers and anglicized to sprue.

The theories concerning its etiology throw some light on the difficulties that the disease presents to the clinician and laboratory worker alike. These theories may be grouped more or less chronologically under several heads. In addition, there is a small number of persons who have maintained stoically throughout the investigative work of the last ten years that sprue is not a disease entity but a symptom complex. This view is held principally by doubting Thomases who have only observed cases in temperate climates as invalided home from the tropics.

Originally, the climatic theory gained great popularity. Today, I think, climate is considered only in the light of a predisposing factor, and not of etiologic significance otherwise.

The dietary theory is one that has gained a few supporters. There are three names particularly prominent in this connection: McGarrison,[5] Nicholls [6] and Scott,[7] each holding somewhat divergent views. McGarrison feels that the disease is primarily due to an underlying dietary deficiency strictly comparable to the avitaminoses, and has produced extremely interesting lesions in monkeys by diet alone. Nicholls advances the view that the symptoms of sprue are dependent on a streptococcus infection of the alimentary canal secondary to and dependent on an underlying dietary deficiency. Scott has recently elaborated a very ingenius theory dependent on a lowered calcium content of the blood, incriminating the endocrine system, particularly the parathyroids. He advances the view that a gastric hyperacidity, induced by the customary high protein and fat diet of Europeans in the tropics, results in pancreatic exhaustion through overstimulation by excessive secretion production. This in turn produces a lack of balance of the other organs of internal secretion, especially the parathyroids, one of the chief functions of which is said to be related to the prevention of intestinal toxemia, and he feels that the calcium deficiency as a result of this parathyroid dyscrasia is the principal factor in causing the symptoms. On this assumption he reports the treatment of eleven patients invalided home to England, and eight patients treated in the East by the administration of parathyroid and calcium lactate, with very satisfactory results. Nicholls' point of view seems the most logical in view of the experimental work presented here, except in the choice of the infectious agent.

By far the greatest group of investigators concede sprue to be an infectious disease. The chief difficulty, as in many other diseases, has been to incriminate the actual causative organism. Originally a parasitic agent was suspected, and *Strongyloides intestinalis* was indicted. This was never confirmed, and the verminous theory was soon discarded. In succession, most of the

* From the Department of Pathology, Medical School of Harvard University.

* Read before the Section on Pathology and Physiology at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

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bacteria have been reported by individual investigators as being responsible for the disease. The streptococcus theory has been the only one to gain much credence. Rogers [8] and Nicholls [6] have been its two most ardent supporters. They both reported treating cases with a streptococcus vaccine, autogenous when possible, and obtained a number of apparent cures. It seems to me, in view of the experimental evidence at hand, that the nonspecific protein reaction must have played an important part in the results. Scott similarly suggests that the success of any vaccine treatment is by its detoxicating effects.

Finally, we come to the mycotic theory. Beginning with Kohlbrugge [9] in 1901, there has been a gradual acceptance by investigators of the importance of the fungi so generally found in the disease. By degrees, the number of suspected fungi has been narrowed, until at the present day there is fairly wide acceptance of *Monilia* as the chief offenders.

Bahr,[10] in Ceylon, Breinl and Priestly [11] in Australia, Dold [12] in China, Ashford [2] and his co-workers, Michel [13] and Martinez [14] in Porto Rico, Wood,[15] Oliver,[16] Boyd,[17] Krauss,[18] Rogers [19] and Simon [20] in the United States, and even Castellani [21] all concede a relationship of the fungi to the symptoms. It is to Ashford, however, that we owe the chief contributions to the fund of our knowledge concerning sprue, and the placing of the disease on a sound laboratory basis as an infection due to the specific monilia *Monilia psilosis* (Ashford, 1914), or *Parasaccharomyces ashfordi,* as it is perhaps more accurately called.

In view of the experimental data that follow, I wish to emphasize at this point that the organism with which we are dealing—*M. psilosis*—is one of very low pathogenic properties, and that for infection to occur in man, I feel quite certain that one or more predisposing factors tending toward lowered resistance must exist. Chief among these should be mentioned (1) long continued residence in the tropics; (2) previous acute or subacute gastro-intestinal infections, especially amebic dysentery; (3) impaired metabolism as a result of unbalanced, excessive or deficient diet, including the prolonged use of alcohol, or (4) a combination of any or all of these.

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MATERIAL

The *Monilia* organisms used in these experiments were obtained chiefly in Manila from the cases of sprue previously cited. In addition, I am indebted to Ashford for several control strains which he was kind enough to send me from Porto Rico. The other strains were isolated from patients in Boston. Two of these strains were obtained from patients with sprue invalided home; one, from a fatal case in a woman of nearly 60 who had lived most of her life in Porto Rico; the other, from a man of 48 from Korea with an advanced case, who has since been lost sight of. As controls, two frank cases of "thrush" in infants yielded strains of *Monilia* which, culturally and serologically, were classified as *Monilia albicans.* Finally, *Monilia* was obtained in almost pure culture at necropsy from the large intestine of a 7 months' old infant with a history of persistent diarrhea for more than one month.

TABLE 1.—*Cultural Characteristics of Monilia* *

Strain	Dextrose	Galactose	Lactose	Levulose	Maltose	Saccharose	Litmus Milk	Gelatin	Sabouraud's
MS 2	A G	?A 0	0 0	0 G	A G	A 0	0 0	Typical	B
MS 3	A G	?A 0	0 0	0 G	A G	A G	0 0	Typical	A
MS 4	A G	?A 0	0 0	0 0	A G	A 0	0 0	Typical	B
MS 6	A G	?A 0	0 0	0 0	A G	A 0	0 0	Typical	B
MS 8	A G	?A 0	0 0	0 G	A G	A 0	0 0	Typical	B
MS 10	A G	A 0	0 0	0 0	A G	0 0	0 0	Typical	C
MS 11	A G	A 0	0 0	?A 0	A G	0 0	?A 0	Atypical	C
MS 12	A G	?A 0	0 0	0 0	A G	A G	0 0	Typical	A
MS 14	A G	A G	0 0	0 0	A G	A 0	0 0	Typical	B
MS 15	A G	A G	0 0	0 0	A G	0 0	?A 0	Atypical	C
MS 16	A G	?A 0	0 0	?A G	A G	A 0	0 0	Typical	B
MS 17	A G	?A 0	0 0	0 0	A G	A 0	0 0	Typical	B
MS 19	A G	?A 0	0 0	0 0	A G	0 0	0 0	Typical	C
MS 20	A G	?A 0	0 0	0 0	A G	A 0	0 0	Typical	B
MS 21	A G	?A 0	0 0	0 G	A G	A 0	A 0	Typical	B
MS 22	A G	A G	A G	A G	A G	A G	A C	Atypical	A
MS 23	A G	A G	0 0	A G	A G	A G	0 0	Atypical	A
MS 24	A G	?A 0	0 0	0 0	A G	A G	0 0	Typical	A
MS 25	A G	?A 0	0 0	0 0	A G	0 0	0 0	Typical	C
MS 27	A G	A G	A G	A G	A G	A G	A C	Atypical	A
MS 29	A G	?A 0	0 0	0 0	A G	0 0	?A 0	Atypical	C

* In this table, A indicates acid; G, gas; 0, no change; C, coagulation. Carbohydrate mediums: Dunham's peptone solution with 2 per cent. of carbohydrate added to a neutral litmus solution. Standard 75 by 10 mm. inverted tube used for gas production. Tubes read on fifth day. Inoculation made by 0.1 c.c. of a standardized three day culture in salt solution. Gelatin: Typical, inverted pine-tree growth; atypical, more or less uniform growth along stab line. Sabouraud's: A, profuse mycelial growth; B, moderate mycelial growth; C, slight or no mycelial development.

I am indebted to Dr. B. K. Ashford for confirming several of the earlier strains of *Monilia* which I obtained as being definitely *M. psilosis.*

The experimental work was started in Manila and, in view of the early results, it seemed worth while to continue the laboratory investigation of this disease, which is becoming more and more important, as travel is steadily increasing and business interests expanding in those tropical and subtropical countries where the disease is more or less endemic.

The identification of *Monilia* was originally based on the criteria established by Ashford: viz., the carbohydrate reactions, the "inverted pine-tree" appearance in gelatin, the appearance on Sabouraud's maltose-agar, and the microscopic characteristics of the adult yeast forms (Fig. 1). Subsequent cultural studies tend to emphasize the possibilities of subtypes, as Hannibal and Boyd [22] have suggested, based on the appearance of massive 3 months old Petri dish cultures, and on the reaction with saccharose. These cultural features, however, do not persist when we apply serologic tests. No type specificity is found, although a very definite fixation of the complement is noted in animals immunized by any of the three described types, while the controls

22. Hannibal, E. A., and Boyd, M. F.: The Monilias of the Gastro-Intestinal Tract in Relation to Sprue, Am. J. Trop. Med. **1**: 165, 1921.

using *Monilia albicans* as an antigen show no fixation. Furthermore, it is next to impossible to secure any specific complement fixation for *M. albicans* in animals, regardless of how immunization is attempted or in what doses the organism is administered, whereas with *M. psilosis* it regularly occurs. *M. albicans* is apparently nonpathogenic, and acts almost like an inert substance when introduced into the experimental animal.

Hines [23] has recently reported cultural studies on a strain of *Monilia* from an old case of sprue and "wild" yeasts obtained from nonsprue cases. He attempted agglutination studies, and, in spite of very suggestive results, decided that there was no definite specific agglutinin formation. The technic of agglutination experiments with these organisms is an extremely delicate procedure, for they normally agglutinate spontaneously. Unquestionably a technic such as Dochez and his co-workers have employed in studying the streptococci of scarlet fever might be employed successfully, but it does not seem as if enough information of value would be obtained. Those most familiar with *Monilia* have discarded agglutination studies for this reason. Similarly, after a few attempts, I felt that the interpretation of results was so open to question that the time-consuming technic necessary made it impracticable to study the agglutination reactions. It seemed, however, as if the agglutinin production followed the fixation of the complement pretty closely, in the few attempts I made to demonstrate its presence.

As most of the experimental work has been aimed at trying to reproduce the disease in animals, these mycologic observations have been conducted chiefly from the point of view of identification. Table 1 illustrates the more important cultural characteristics of the strains studied. According to Ashford, *M. psilosis* regularly ferments dextrose and maltose, usually ferments levulose, and irregularly acts on galactose and saccharose. I have found that cultures that have been transplanted once a month for periods of more than a year are apt gradually to lose their ability to ferment the carbohydrates with the production of gas, although the acidification of the mediums usually persists unaltered. Animal passage usually brings back the fermentative reaction to its original degree.

Another feature of prolonged cultivation is the development of mycelium. This represents apparently the "resting" or resistant stage of the organism and, if a parallel may be drawn, might be said to correspond in a general way to the spore production of certain bacteria. Thus, Sabouraud subcultures more than a year old present a much different appearance from that of freshly isolated stool cultures, or from strains that have been passed through animals. The older cultures are drier and very adherent to the surface, and the mycelium often penetrates the entire thickness of the medium. This would seem to explain the intermittent character of the symptoms in the early stages of the disease; the frothy diarrhea accompanying the yeast cell production; the remissions occurring with the mycelial phase of growth of the organism.

If we bear these developmental differences in mind, some of the confusion regarding the identification and classification of *Monilia* may be cleared up. Certain fundamental rules can be borne in mind. Before attempting classification of old cultures, animal inoculation should be made. In the case of *M. psilosis,* intraperitoneal injection of about 2 c.c. of a saline suspension of the organisms will serve. After from forty-eight to seventy-two hours, definite mycotic abscesses will be found, and usually the organism can be recovered from the gastro-intestinal tract. If a strain has been attenuated by prolonged cultivation, two or three successive inoculations may be required to heighten its virulence so that death will follow in that time interval. In the case of *M. albicans,* intravenous injection of from 5 to 10 c.c. into a rabbit may produce a septicemia with liver lesions from which the organism can be recovered. The animal will show no symptoms; blood cultures will usually be negative, and it is only by killing the animal that cultures can be secured. Similar intravenous inoculation of rabbits with *M. psilosis* usually produces a fatal septicemia in from twenty-four to seventy-two hours.

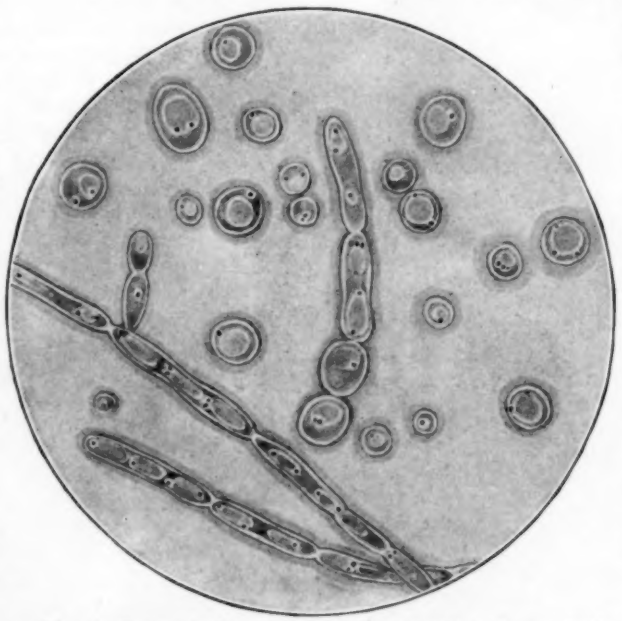

Fig. 1.—Camera lucida drawing of Monilia psilosis in unstained hanging drop preparation, illustrating both mycelial and yeast forms of the organism.

This procedure leaves out of consideration the possibility of other species of *Monilia.* In general, it has been demonstrated by Castellani and others that most species of *Monilia* are nonpathogenic and accordingly can be excluded as *M. psilosis* by this method. Other pathogens can probably be identified by cultural or serologic means in case of doubt. Hines,[23] in his paper, brings out the production of septicemia and mycotic abscess with *Monilia* from sprue cases, but does not give much credit to its possible significance from the point of view of differential identification.

Reverting for a moment to Hannibal and Boyd's [22] work on the typing of *M. psilosis* on the basis of the reaction with saccharose and the extent of mycelial formation in massive Petri dish cultures, there seems to be no doubt that such a classification can be made. Type A ferments saccharose with the production of acid and gas, and shows a very marked mycelial development. Type C does not ferment saccharose, and the mycelial formation is negligible. Type B occupies a point midway, usually acidifying the medium, but producing no gas, and having only a moderate mycelial development. By standardizing our cultures through

23. Hines, L. E.: Studies on the Identification of Monilia Psilosis, J. Infect. Dis. **34**: 529 (May) 1924.

animal passage, this mycelial feature may be maintained, but subcultures soon lose this characteristic and all tend to approach Type A, at the same time losing their fermentative characteristics (Figs. 2, 3 and 4).

From the clinical standpoint, this attempt at subclassification seems of some little significance. The point has been raised as to whether these differences implied that we were dealing with different organisms

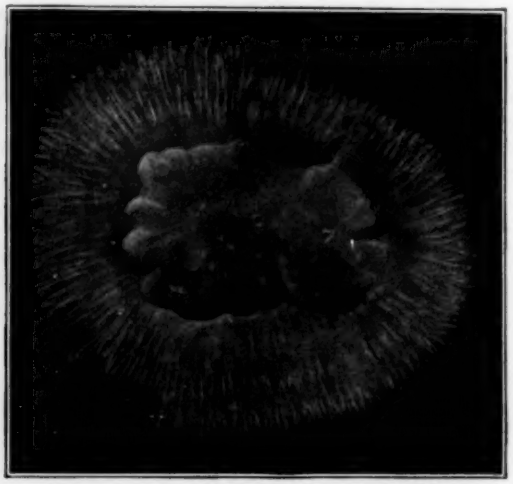

Fig. 2.—Type A: marked mycelial production.

or with type variations of the same organism. Recognizing the greater importance of the serologic reactions, it seems that these differential cultural characteristics merely represent subtypes rather than separate species. The chief practical interest, as it appears to me, is that until we know more about *Monilia* and sprue we should make use of a polyvalent vaccine containing all three types, as there may be some comparable specific antibody formation, as noted in the various types of pneumococci, meningococci, etc. This may explain the differences that have been noted clinically with the use of *Monilia* vaccine in the treatment of cases.

ANIMAL EXPERIMENTS

The experimental work has been going on now for nearly a year and a half. In a paper of this scope, only an outline of the methods and results can be gone into, as the detail involved in recording the protocols of all the animals would be merely repetition.

The earlier work carried on in Manila led me to believe that, by slight modifications in technic exceedingly interesting results might be obtained. It is to be regretted that monkeys are not more readily available in this part of the world, for I feel that much more valuable evidence could be obtained by further experimental work with them.

Rollowing the identification of *Monilia* by cultural methods, toxicity experiments were carried out by the intraperitoneal inoculation of 5 c.c. of a saline suspension of the organisms. For most of the experimental work, two strains of *M. psilosis* from Manila were used. These were controlled by identical experiments using (1) a strain of *M. psilosis* supplied by Ashford, (2) a strain of undoubted *M. albicans* from a case of thrush, and (3) by a strain of *Monilia* (*Monilia X*) isolated at necropsy from the colon of the 7 months old infant with a history of fermentative diarrhea for more than a month previously cited.

The first series of experiments were carried out with normal guinea-pigs on the usual routine laboratory diet of oats, carrots and hay. All these earlier experiments were conducted in duplicate. Various methods of inoculation were tried to find the most effective: intravenous, intraperitoneal, subcutaneous, intraglossal and by mouth. The intravenous route in the case of *M. psilosis*, except in very small doses, proved to be unsatisfactory, as septicemia and death occurred too frequently. The intraperitoneal method was fairly satisfactory by using doses of about 0.5 c.c. of a 1 per cent. saline suspension. The subcutaneous method was discarded as moniliasis of the gastro-intestinal tract never resulted, and local abscess formation was the only lesion produced. The intraglossal method possessed no advantage over the oral route except in the production of a local lesion. Various methods of introducing the organisms by mouth were tried. The most satisfactory results were obtained by the use of a catheter attached to an ordinary Luer syringe, by which means as much as 10 c.c. of a *Monilia* suspension could be introduced directly into the stomach.

As a result of these preliminary experiments, the intraperitoneal and oral methods of administration were decided on as the most satisfactory, and comparable experiments using these two methods adopted as routine. In addition to the guinea-pigs, rabbits were occasionally employed to check the results, and, in Manila, five monkeys were given *Monilia* by mouth.

These monkey experiments I can summarize very briefly. In all five animals a moniliasis of the gastro-intestinal tract was induced, which persisted for several weeks, and the organisms were recovered regularly from the stools. Four of the animals showed no symptoms during the experimental period except a temporary frothy diarrhea for about two weeks, which gradually subsided. The fifth monkey presented a slight rise in temperature of about 1 C. for six days, accompanied by a definite diarrhea. The loose stools persisted for another three weeks, with anorexia and loss of weight. Death occurred a month after the experiment started, the immediate cause being a diffuse bronchopneumonia. *Monilia* was recovered at necropsy from the ileum and colon. The pathologic condition was restricted to the gastro-intestinal tract. The mucosa of the intestines was moderately injected, and several small, superficial ulcers were found, in one of which mycelia were demonstrated histologically.

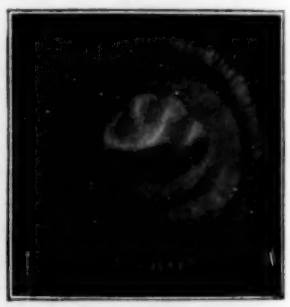

Fig. 3. — Type B: moderate mycelial production.

A series of forty guinea-pigs was then inoculated by a single dose with the various stains of *Monilia*, half by the intraperitoneal, and half by the oral method. The dosage varied from 0.5 to 10 c.c., as determined by the preliminary toxicity experiments. Close observation of temperature and clinical symptoms was made. The *M. albicans* group, consisting of eight guinea-pigs, presented no symptoms, and stool cultures, taken at weekly intervals, were negative after the second to third week. The unknown *Monilia* organisms likewise gave nearly the same negative results, although they were recovered from the stool as long as five weeks after inoculation in three of the animals, and there was a definite but slight diarrhea in two of these cases, intermittently for nearly a month. At necropsy, no demonstrable lesions were found.

In the *M. psilosis* group of twenty-four animals, there was a moniliasis that persisted for from eight to twelve weeks on the average, and, in two animals, stool cultures were positive after five months. These two guinea-pigs at necropsy showed definite lesions of the gastro-intestinal tract. The tongue presented small, aphthous ulcers. The ileum was distended and exceedingly thin walled. The mucosa was moderately injected, and, on section, a chronic inflammatory infiltration was noted toward the ileocecal valve. The colon showed the most marked changes, with definite evidence of chronic infiltration of the submucosa, and a few minute superficial ulcers. The whole colon was pale and distended, and the stool contents were pasty, with a few gas bubbles and a decided yeasty odor.

Fig. 4.—Type C: negligible mycelial production.

On the basis of these earlier experiments, it was decided to carry out a second series of experiments, a diet being used that was known to be deficient in vitamins. From previous feeding experiments to ascertain the antiscorbutic content of certain foodstuffs, we were in a position to predict the onset of scorbutus within from two to three days. The diet given was one in which soy bean flour was used as a base, with the necessary salts added. Butter fat was employed to supply the fat soluble vitamin and to increase the caloric value of the food. The diet as finally given was deficient only in the so-called C vitamin. On this diet, scurvy could be expected to develop in from fifteen to eighteen days. In these experiments, the weight curves were followed, and on the fourteenth day (which usually was the time that loss of weight began to occur) the inoculation of the animals with *Monilia* by the intraperitoneal and oral routes was carried out. The scorbutic diet was maintained for one week after inoculation, except that minimal amounts of orange juice (2 c.c.) were added to prevent acute scurvy. After a week's interval, the normal diet of carrots, oats and hay was resumed, and the animals were closely followed.

A series of twenty guinea-pigs was used. The results were most suggestive. In all the animals, a moniliasis of the gastro-intestinal tract ensued, evidenced clinically by a varying degree of diarrhea, and in many cases by patches of "thrush" on the tongue. From the laboratory side, cultures were taken at weekly intervals, and *Monilia* was recovered for from three to thirty weeks after inoculation.

As in the early experiments, the four *M. albicans* animals were the least affected. After from a month to six weeks they appeared entirely normal, and stool cultures were negative. Their complement likewise showed no fixation with either *M. albicans* or *M. psilosis* being used as antigen.

With the unclassified *Monilia,* recovery ensued after a somewhat longer interval in three of the animals. The fourth one died of pneumonia at the end of the second week. Injection of the colon was noted at necropsy, but no focal lesions were found.

In the pigs inoculated with *M. psilosis,* a very different course was noted. Of the twelve animals inoculated, two recovered after from three to four months of intermittent diarrhea accompanied by loss of weight. *Monilia* ultimately disappeared from the stools, and they regained their normal weight. The other ten pigs died at varying intervals following inoculation. Two of them died in less than a week of a generalized *M. psilosis* septicemia. These were both inoculated by the intraperitoneal injection of 0.5 c.c. of the usual 1 per cent. saline suspension of a seventy-two hour culture. No differences in reaction were noted in the three strains of *M. psilosis* used. One of the pigs that recovered was injected with Ashford's control strain, the other with a Manila strain. The two pigs dying of septicemia represented the two Manila strains.

The eight remaining guinea-pigs lived on an average of four and one-half months, and all showed a persistent moniliasis by stool culture up to the time of death. As will be noted by Table 2, these pigs presented a varying degree of diarrhea during this period. At no time was blood noted in the stools grossly. The animals on the average held their weight fairly well for from ten to twelve weeks, and then began to lose. This is quite in accord with the clinical picture of sprue as noted in human beings, and helps support our hypothesis that *M. psilosis* is the responsible agent in producing the symptoms.

At necropsy, the pathologic changes that this group of guinea-pigs presented was quite striking and uniform. With the exception of the cases of septicemia, the lesions were confined to the gastro-intestinal tract, and more or less restricted there to three areas: (1) the tongue, (2) the ileum and (3) the colon. The lesions in the two parts of the intestine were quite comparable and can be discussed together.

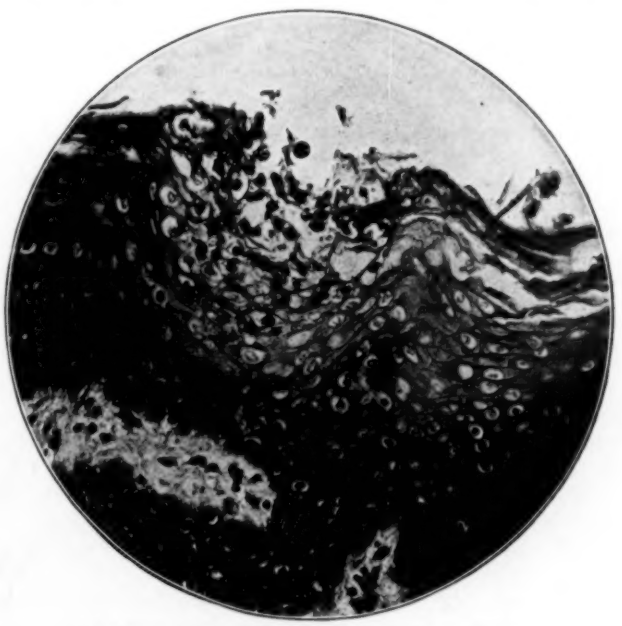

Fig. 5.—Superficial aphthous ulcer of the tongue.

PATHOLOGIC CHANGES

The mucosa of the tongue presented either (1) discrete or conglomerate areas of an adherent, grayish white "thrush" membrane or (2) small, superficial, aphthous ulcers (Fig. 5). Microscopically, these both represented erosion of the superficial epithelium, with or without an accompanying subacute cellular infiltration of the corium. In some of them, mycelial penetration of the epithelium was noted. In the older lesions, a fibrosis of the corium was noted, as well as an atrophy of the epidermis, which was only two or three cells deep and showed a loss of the papillae.

In the intestine, similar superficial ulcers were occasionally found in the terminal ileum and colon, especially in relation to the lymphoid structures. There was a marked loss of tone, with subsequent distention of the intestine, chiefly dependent on the carbohydrate fermentation by *Monilia,* it was thought. The question of mucosal atrophy is always a difficult one to determine, the depth of the mucous glands depending on so many factors. It was felt that there was an actual reduction in the glandular surface, however, and some increase in the cellular elements of the submucosa. The congestion of the mucosa varied, usually with the duration of the symptoms, the earlier acute cases presenting more marked vascularity.

Irregular examinations of the blood never revealed the same degree of anemia that was found in the Manila cases, although a recognizable degree of secondary anemia was found in four of the animals. At the present writing, I am inclined to regard the anemia as an exhaustion type only occurring late in the disease.

COMMENT

The distressing uncertainty of the etiology of sprue has been the reason for this paper. That this uncertainty is very real, both here and abroad, let me quote from one or two of the current journals. Manson-Bahr,[3] at the conclusion of a recent meeting of the Royal Society of Medicine, says: "It seems to be generally agreed that the causative organism of sprue, if there be one, has not been found, and sprue is probably neither a microbic nor a protozoal disease."

On the other hand, the *Monilia* theory is an extremely attractive one. Bastedo and Famulener,[24] in a piece of work on the clinical laboratory findings in a number of cases of sprue seen in New York, come to the conclusion that *"Monilia"* is an important accompaniment of most sprue cases, but that *M. psilosis* is probably not a distinct species with specificity for sprue.

As has been brought out by the experimental evidence here, the pathogenicity of even *Monilia psilosis* is very slight, except in suitable soil. The problem seems to be to reconcile this fact. We can do this by accepting a dual etiology in the development of the disease, as has been proposed numerous times. Whether the underlying factor is a calcium deficiency dependent on an excessive fat or protein dietary, or an avitaminosis, as McGarrison and Ashford intimate, or some other disturbance of metabolism as yet not recorded, but possibly related to long continued residence in the tropics, or a previous infection, with its concomitant diminished resistance, seems to be quite inconsequential from a theoretical standpoint. All reduce the vitality of the individual so that moniliasis may result. If it happens to be *M. psilosis,* sprue is liable to follow. This is particularly true of Europeans and Americans, who have not had the opportunity of developing an immunity in childhood. Such a theory adapts itself readily to an interpretation of the clinical picture of the disease, and it is supported by the experimental evidence recorded here.

SUMMARY AND CONCLUSION

Experiments support Ashford's theory of the specific etiology of sprue as due to *Monilia psilosis* by the production in guinea-pigs of a chronic moniliasis with gastro-intestinal lesions roughly comparable to those found in man.

The development of the lesions, however, was rarely noted except in animals fed on a diet partially deficient in vitamins, especially the antiscorbutic vitamins. This favors the view that a deficient diet, or diminished resistance such as is common following long residence in the tropics associated frequently with gastro-intestinal infections such as amebic dysentery, are contributory factors in its production. Mycologic studies on twenty-one strains of *Monilia* obtained from Manila and from cases in Boston invalided home are in accord with the tentative classification into three subtypes—A, B and C—as suggested by Boyd and Hannibal.

TABLE 2.—*Summary of Experiments, a Scorbutic Diet Followed by Inoculation with Various Strains of Monilia Being Used*

Guinea-Pig	Organism	Strain	Method	Duration of Positive Stool Cultures	Diarrhea	Outcome	Pathologic Changes
320	M. albicans	MS 27	Intraperitoneal	3 weeks	Slight	Recovered	None demonstrated
321	M. albicans	MS 27	Intraperitoneal	5 weeks	Slight	Recovered	"Thrush" tongue lesions; 1 week
322	M. albicans	MS 27	By mouth	4 weeks	Slight	Recovered	None demonstrated
323	M. albicans	MS 27	By mouth	5 weeks	Slight	Recovered	None demonstrated
324	Monilia X	MS 11	Intraperitoneal	6 weeks	Moderate	Recovered	None demonstrated
325	Monilia X	MS 11	Intraperitoneal	2 weeks	Moderate	Died	Pneumonia; no gastro-intestinal lesions
326	Monilia X	MS 11	By mouth	8 weeks	Slight	Recovered	None demonstrated
327	Monilia X	MS 11	By mouth	5 weeks	Slight	Recovered	"Thrush" tongue lesions for 3 weeks
328	M. psilosis	MS 6	Intraperitoneal	21 weeks	Moderate	Died	Tongue and intestinal lesions
329	M. psilosis	MS 6	Intraperitoneal	12 weeks	Moderate	Died	Tongue and intestinal lesions
330	M. psilosis	MS 6	By mouth	16 weeks	Moderate	Recovered	None demonstrated
331	M. psilosis	MS 6	By mouth	15 weeks	Moderate	Died	Intestinal lesions
332	M. psilosis	MS 15	Intraperitoneal	18 weeks	Marked	Died	Tongue and intestinal lesions
333	M. psilosis	MS 15	Intraperitoneal	5 days	Severe	Died	Septicemia; M. psilosis
334	M. psilosis	MS 15	By mouth	13 weeks	Moderate	Recovered	None demonstrated
335	M. psilosis	MS 15	By mouth	23 weeks	Moderate	Died	Intestinal lesions
336	M. psilosis	MS 19	Intraperitoneal	6 days	Severe	Died	Septicemia; M. psilosis
337	M. psilosis	MS 19	Intraperitoneal	17 weeks	Moderate	Died	Tongue and intestinal lesions
338	M. psilosis	MS 19	By mouth	30 weeks	Moderate	Died	Intestinal lesions
339	M. psilosis	MS 19	By mouth	14 weeks	Moderate	Died	Tongue and intestinal lesions

ABSTRACT OF DISCUSSION

DR. DAVID J. DAVIS, Chicago: With reference to the different types of organisms of this general group, I may say that some seem to be very highly plastic. I have not worked with *Monilia,* but strains of *Sporotrichum* and *Blastomyces* throw off what appear to be mutants. These forms grow and apparently breed true indefinitely. I should like to ask Dr. Smith whether he has observed any such mutant forms in his work.

DR. LAWRENCE WELD SMITH, Boston: As I said, I think one of the greatest difficulties with this work has been the changes in form. For this reason, tests devised to recover the organism in its original form seem to be the only definite way of differentiation. Morphologically, it is impossible to define them. For a matter of weeks and months they may appear the same. After an interval of three or four months, *Monilia psilosis* cultures occasionally show a change in color, whereas the other cultures remain white.

24. Bastedo, W. A., and Famulener, L. W.: A Critical Study of Cases of Sprue, J. A. M. A. **81**: 2102 (Dec. 22) 1923.

VALUE OF THE ROENTGEN RAY IN DIAGNOSIS OF TUMORS OF THE JAW *

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AND
FREDERICK A. FIGI, M.D.
ROCHESTER, MINN.

In the diagnosis of tumors around the jaws, the roentgen ray is of value in determining whether the condition is primary in the jaw, or whether the jaw is involved in an inflammatory or malignant process around it. In the examination, roentgenograms, therefore, should be made at various angles. Often a roentgenogram of the jaw taken in lateral view will be negative, while one taken in the anteroposterior or oblique view will reveal the lesion, particularly if it is at the angle or at the ascending ramus. In this study, the various types of tumors were classified clinically and

Fig. 1.—Giant cell tumor of the upper jaw.

pathologically, and the roentgenograms were examined to determine their value in making the diagnosis.

DIAGNOSIS

In the interpretation of roentgenograms of tumors of bone, certain points have been emphasized by various observers [1] that may aid in the diagnosis: (1) The shape of the tumor: a benign tumor of the bone is usually oval, destroying the bone equally in all directions. (2) The character of the outline of the shell of the tumor: benign and slow-growing malignant tumors expand the bone with a deposit of new bone underneath the periosteum, while more rapidly growing malignant tumors may erode the cortex of the bone, or destroy it entirely. (3) Destruction of bone: rapidly growing malignant tumors destroy the bone equally in all directions, and the roentgenograms reveal a cavity in

Fig. 2.—Same case after operation.

the bone without a deposit of new bone around it; a moth eaten area is often seen along the margin of the tumor. (4) Production of bone: in the benign tumors or cysts, bone is produced underneath the periosteum as the bone expands, making a definite shell to the tumor. Osteosarcomas, periosteal sarcomas and osteo-

Fig. 3.—Solid odontoma.

mas produce bone within themselves. Trabeculae of new bone may be laid down, appearing like a tumor divided by striae. This does not occur in carcinoma or the rapidly growing sarcoma.

Besides these general points in the diagnosis of tumors of bone, there are certain special considerations [2]

* From the Section on Laryngology, Oral and Plastic Surgery, Mayo Clinic.

* Read before the Section on Stomatology at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

1. Baetjer, F. H.: Differential Diagnosis of Bone Tumors, Am. J. Roentgenol. **5**: 260-264 (May) 1918. Baetjer, F. H., and Waters, C. A.: Injuries and Diseases of the Bones and Joints: Their Differential Diagnosis by Means of the Roentgen Rays, New York, Paul B. Hoeber, 1921. Bloodgood, J. C.: The Diagnosis and Treatment of Benign and Malignant Tumors of Bone, J. Radiol. **1**: 147-238 (March) 1920; Benign Bone Cysts, Ostitis Fibrosa, Giant-Cell Sarcoma and Bone Aneurysm of the Long Pipe Bones, Ann. Surg. **52**: 145-185, 1910. Harris, C. P.: The Generalized Type of Osteitis Fibrosa Cystica—von Recklinghausen's Disease, Am. J. Roentgenol. **11**: 146-155 (Feb.) 1924. Lovett, R. W., and Wolbach, S. B.: Roentgenographic Appearance, Diagnosis and Pathology of Some Obscure Cases of Bone Lesions, Surg., Gynec. & Obst. **31**: 111-131 (Aug.) 1920. Pacini, A. J.: A Concept of X-Ray Pathology, M. Rec. **99**: 218-226, 1921.

in connection with tumors of the jaw that will be discussed with individual tumors. A thorough knowledge of the gross pathology of tumors of bone in general, as well as a knowledge of the special pathology of tumors of the jaws, is essential in interpreting the roentgenograms. It is well known that it is not always possible

Fig. 4.—Adamantinoma of the lower jaw; trabeculation.

to determine from a roentgenogram whether a tumor is malignant, benign or inflammatory. The age of the patient and the clinical history may aid in deciding this point.

BENIGN SOLID TUMORS

It is often impossible to decide from the roentgenogram whether we are dealing with a cystic or a solid tumor of the bone. Both may appear as expanding central tumors with definite shells. Their varying density may help in the differentiation. The appearance of slow-growing malignant and benign tumors is similar in the roentgenogram. Osteomas and fibro-osteomas may be distinguished with difficulty from osteosarcomas in the roentgenogram, since they are all bone-forming tumors. The important observation has been made that in osteosarcoma the bone striae are deposited irregularly, and tend to be perpendicular to the shaft of the bone, whereas in osteoma and osteofibroma they are longitudinal or parallel to the shaft. Leontiasis ossium is usually associated with syphilis; it presents a diffuse bony thickening of the bones of the face, and bears out the observation of Lovett and Wolbach that syphilis is the most purely formative of the inflammatory processes affecting bone. The involvement is usually found around the orbit and nasal cavities, and along the body of the mandible. The diagnosis can be made from the roentgenogram. Solid odontomas present a typical picture which is not seen in any other type of tumor of the jaw, a rounded shadow, which may be somewhat irregular in outline, situated in the body of the jaw and often in a cystic cavity. The shadow is as dense as that seen in tooth structures. It may appear as one large mass, or as several small ones. A giant cell tumor appears as an expanding cyst with trabeculations, and usually with more density than a cystic tumor.

Fibromas are most common in the inferior maxilla. They usually arise in the periosteum, but in rare instances are central in origin; at times they arise in the upper jaw, and encroach on and enter the antrum of Highmore. Medullary fibromas of the jaw are decidedly prone to calcification and may even ossify; the diagnosis can readily be made from the roentgenogram in the typical case. Myxomas do not present characteristic findings in the roentgenogram, and a definite diagnosis is possible only by exploration. The roentgenogram in such cases establishes the fact that the tumor is benign, but does not establish the cellular pathology (Figs. 1, 2 and 3).

BENIGN CYSTIC TUMORS

We have reviewed the roentgenograms of (1) cystic odontomas, which include the adamantinomas; (2) the simple cysts which are often called dentigerous or follicular; (3) an indeterminate group of cysts, the true etiology of which is not very clear, and (4) osteitis cystica.

The adamantinomas can usually be diagnosed from the roentgenogram; the multilocular character of the expanding cyst with trabeculation is typical. However, in the older cysts, the bone is often entirely destroyed, leaving only a thin, fibrous wall over a greater part of the tumor. The remaining part of the bone will show the multilocular character. In the roentgenogram, an adamantinoma will sometimes appear as a unilocular cyst with no apparent trabeculation. The various cysts extending from the larger pocket are

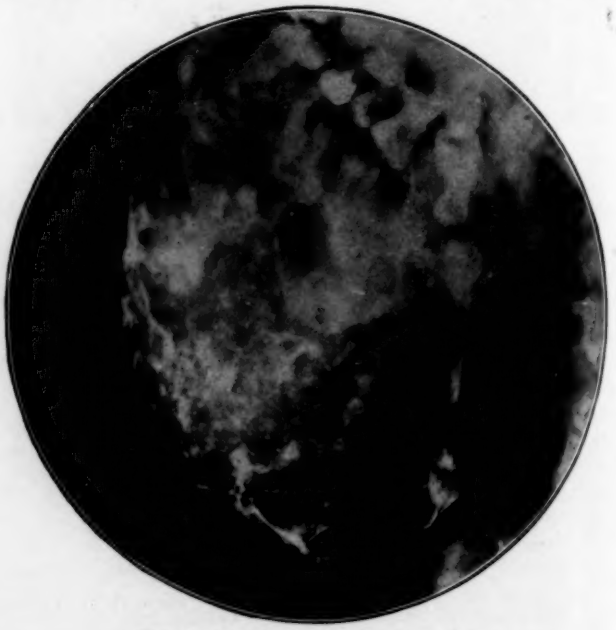

Fig. 5.—Osteofibroma of the lower jaw.

found at operation. Occasionally, however, a unilocular adamantinoma is encountered, the clinical history and roentgenographic appearance of which are absolutely characteristic of a simple benign cyst, and even at operation, without the aid of the microscope, differential diagnosis is impossible. The location of this type of cyst, usually at the angle of the lower jaw, may aid in

2. Kirkham, H. L. D.: Tumors of the Alveolar Border of the Jaws, Texas State J. Med. **17**: 350 (Nov.) 1921. New, G. B.: Cystic Odontomas, J. A. M. A. **64**: 34-39 (Jan. 2) 1914. Scudder, C. L.: Tumors of the Jaws, Philadelphia, W. B. Saunders Company, 1912.

making a diagnosis from the roentgenogram. The age of the patient may also help to determine the nature of the cyst. The average age at which the adamantinomas are noted is 33 years. Occasionally this type of cyst is found in the upper jaw. The simple cysts may be of two types: Type A, called dentigerous cysts, and Type B, usually called follicular cysts. In the latter group, the roentgenogram will show a partially developed tooth in a unilocular cystic cavity. In the former, the roentgenogram will show nothing characteristic. An indeterminate group of cysts which usually occur at the angle of the jaw and ascending ramus, extending up into the ramus, do not present characteristic roentgenograms. At operation they are found filled with material resembling thin, cooked oatmeal. We have never found an epithelial lining in them. The condition is usually unilocular, and its exact cause is not known.

Generalized osteitis fibrosa cystica is considered by Albee as intermediate between benign and malignant tumors. He asserts that many of the cysts are of a sarcomatous nature, while others are purely innocent. The cause and pathogenesis of the process are unknown. The disease rarely affects the maxillae. In the roentgenogram, small cystic areas are seen scattered throughout the thinned cortex, the structures of the bone being replaced by trabeculae enclosing multiple cysts of various sizes and shapes. Complete local destruction of the cortex may occur, but the periosteum is not involved (Figs. 4 and 5).

MALIGNANT TUMORS

Malignancy in tumors of the jaw is evidenced in the roentgenogram, as in the microscopic picture, by the progressive destructive invasion of the neoplasm. We have divided such tumors into three groups: (1) primary malignant surface tumors, (2) primary malignant central tumors, and (3) metastatic tumors. Squamous cell epitheliomas, or the periosteal sarcomas, are typical of the first group. If the disease is well advanced, the roentgenogram will reveal destruction of the maxilla, beginning with the periosteum and gradually extending into the body of the jaw, without a tendency to the formation of bone. Early squamous cell epithelioma or carcinoma cannot be distinguished from an inflammatory condition. A very slow-growing malignant tumor simulates a benign tumor, and a central endothelioma, or low grade carcinoma presents in the roentgenogram an expanding cyst with a deposit of bone underneath the periosteum, similar to a simple cyst. The rapidly growing and fulminating type of sarcoma shows the typical process of destruction of bone. The roentgenograms of a rapidly growing epithelioma or sarcoma show a destruction of the bone with an irregular moth-eaten appearance of the remaining bone around the tumor, or they may show a clean cut margin of the remaining bone, similar to that seen following resection of the jaw. There is no suggestion of bone production. It is impossible to distinguish many of the primary tumors of the jaw from the metastatic malignant tumors. Multiple myeloma may simulate a local central tumor. The most common metastatic tumor is that seen in the submaxillary region involving the jaw, secondary to a cancer of the lip, cheek or tongue. The tumor gradually destroys the jaw, causing a pathologic fracture.

INFLAMMATORY TUMORS

Many of the conditions around the jaw, of which roentgenograms have been made, have not been true tumors of the jaw, but inflammation of the jaw itself, or of the soft tissues. Inflammatory cysts, secondary to infected teeth, chronic osteitis, and actinomycosis are in this group. All of these conditions produce a thickening around the jaw which may simulate true neoplasm. As a rule, in such conditions, contour of the jaw is normal in the roentgenogram. We have never seen actinomycosis involve the jaw bone itself; it is a disease of the soft tissues, but when it occurs in the hard form, it simulates sarcoma of the jaw clinically. Earlier observers classified it as osteosarcoma previous to the demonstration of the ray fungus. With chronic osteitis there are areas of varying density, some increased and others decreased.

CONCLUSIONS

1. A roentgenogram is of value in the diagnosis of certain types of tumors found only in the jaws, such as leontiasis ossium, solid odontomas and the cystic odontomas, including the adamantinomas.

2. An expanding unilocular cystlike tumor of the jaw may be a benign cyst, central carcinoma, endothelioma, giant cell tumor, fibroma, myxoma or cystic odontoma. The varying density and the presence of striae of bone may aid in differentiating these.

3. It may not be possible, from the roentgenogram and clinical history, to determine whether a condition is inflammatory, benign or malignant. Exploration and removal of tissue for frozen microscopic section should be made in questionable cases.

ABSTRACT OF DISCUSSION

DR. M. C. SMITH, Lynn, Mass.: This is one of the best exhibits of photographs I have ever seen. It is well worth making an effort to have that collection preserved for future study. I doubt very much whether in another twenty or thirty years it would be possible to get such a collection together.

DR. GEORGE M. DORRANCE, Philadelphia: It is a mistake to curet all tumors of the mouth and attempt to cure them by this procedure. I have seen three cases recently that have been treated by curettement alone. In each case, the patient had a recurrence. In two of them I was able to reoperate successfully. One case was inoperable when I was consulted. My feeling is that one should remove entirely that portion of the jaw in which the cyst is located. Unquestionably, there are some cases in which it is impossible to remove the entire growth. However, I feel that in the average case it is possible to remove that part of the jaw which is involved. In cases of very small cysts, which I have not had the good fortune to see, it may be possible to remove them inside the jaw. I think all adamantinomatous cysts should be excised. It is possible to have an appliance constructed to take care of the defect in partial excision of the jaw bone.

DR. C. W. WALDRON, Minneapolis: This question of tumors of bone is being studied by many groups of men. Within the last few years the bone sarcoma registry was established and these tumors are given careful and detailed study for the purpose of throwing further light on diagnosis and classification particularly. When it comes to the maxilla we are confronted with a big problem. In the jaw, there is some relationship with sinuses that will, perhaps, add to the confusion connected with bone tumor classifications. Dr. Figi has been conservative in his diagnosis. I am glad of that, because this question of adamantinomas is one that is handled differently in different parts of the country. At Rochester, and also at Minneapolis, the pathologists feel that it is a tumor that should be excised radically. Other observers, for instance the committee of the British Dental Association, which worked on this problem for ten years, came to the conclusion that adamantinomas were not malignant, but that they did require careful local removal, and that resection of the jaws was not indicated, except in such cases as the extent of the tumor would warrant. Obviously, one does hesitate to remove a section of the lower jaw in the region of the

bicuspid if it is not absolutely necessary, and it seems to me that some of us can adopt a little more conservative attitude to adamantinomas that have not progressed to any extent, that are only 1 or 2 cm. in size.

DR. W. T. COUGHLIN, St. Louis: It seems to me that the most essential thing is to make a diagnosis early. If we depend on the general surgeon to do that, we often come to grief. It requires a man who is especially qualified to take these pictures, and then if the pictures are well taken there is no question, usually, as to the extent of growth. The manner of approaching it is a matter that is decided by the individual case; if there is any question in the surgeon's mind as to the malignancy of the growth, even if it is small, a roentgenogram of the chest should be made. It is quite striking to one who sees bone tumors in other portions of the body to note the infrequency of metastasizing tumors of the jaws. The reason, perhaps, is that the patient dies too soon; but it can happen that a tumor seemingly well outlined and solid, casting a shadow like solid bone, can break through its capsule as a tumor of the soft tissue can and invade the surrounding bone, taking on all the aspects of malignancy without metastasizing. The tumors that we see usually are not so large as many of these that have been shown here this afternoon.

DR. L. W. JUERGENS, Milwaukee: I should like to ask what these conservative measures shall consist of.

DR. GEORGE V. I. BROWN, Milwaukee: I should like to ask Dr. Figi to tell us something of the prognosis and the methods of treatment that they have followed at the Mayo Clinic, based on their roentgenographic reports as described in the paper. I have seen some of these cases and thus know the good results of this treatment. I feel sure it would be instructive to have this additional information.

DR. HERBERT A. POTTS, Chicago: I think the importance of a clinical diagnosis, not relying entirely on the roentgenogram, has been very definitely brought out. The slides, which have confirmed the diagnosis at operation, have shown that it is impossible in many of these cases to make the correct diagnosis from the roentgenogram; consequently, the clinical experience of the operator is the main factor. It is a serious thing to resect the jaw, much more serious than I think the average surgeon realizes. It is brought home to the dentist or the oral surgeon more strongly, when some sort of a substitute must be made for the resected jaw. In these cases, which seem to cause absorption of the bone, we will say from the outside, I think we were justified, after having roentgenographed the rest of the body for metastasis, to treat them conservatively. Even in the case of some of the epitheliomas that have not invaded the bone, if a partial resection could be done, and the continuity of the jaw retained, it is much better than resecting the whole jaw, and experience has proved that it is just as successful from the mortality standpoint. Another type is the giant-cell tumor. And just now there is a discussion as to whether or not these tumors should be termed malignant. Undoubtedly, tumors do degenerate into malignancy, and it seems from recent observation that the giant-cell tumors are not different from some of these; but I think this occurs only occasionally. In the French literature there have been reported recently four cases of metastasizing giant-cell tumors. Dr. Phemister has on exhibit here a tumor of the end of the radius, a typical giant-cell tumor, which seven years later produced the same growth in the lung. But that is rare. We see many of these giant-cell tumors, and in the majority of the cases if a conservative operation is done and the tumor is eradicated, the patient is spared a great deal of annoyance. Dr. Gilmer has operated on many of these tumors, saving only a portion of the jaw bone, but going beyond the tumor tissue, of course, with the resulting retention of the continuity and the perfect health of the patient years and years afterward. The classification of these tumors in the jaw seems to be becoming more hazy, but we undoubtedly shall arrive at a better classification as the study proceeds.

DR. ROBERT H. IVY, Philadelphia: I might say that I am inclined to agree with Dr. Waldron and Dr. Potts that conservative measures are justifiable in the smaller adamantinomas. Here growth is so slow that if any cells are left after the first operation we have time to reoperate and keep the tumor under control and finally cure it by conservative operations within the mouth; this applies not to all cases, but those of lesser extent.

DR. FREDERICK A. FIGI, Rochester, Minn.: In answer to Dr. Brown's request for a brief statement of the treatment of tumors of the jaws, I would say that in the case of benign solid tumors, if the growth is not too extensive, it may be curetted out. If it is so extensive that the entire thickness of the jaw is pretty well destroyed, a resection will be necessary. The treatment of the simple cysts of the jaw is merely curetting out the lining, swabbing the cavity with some caustic solution or cauterizing it lightly, and removing enough of the wall to permit it to collapse. The first case of adamantinoma of the jaw shown was taken care of a number of years ago, when radical resections were being done for this type of tumor. A tumor of the extent of that shown could scarcely be taken care of otherwise. The localized adamantinoma is treated by curetting out the lining, then swabbing the cavity with Harrington's solution, which is a hydrochloric acid preparation, and removing as much of the cyst wall as possible. Regarding the treatment of the malignant tumors, the surface epitheliomas are excised by means of the cutting cautery, or cauterized with soldering irons or by means of diathermy. The medullary carcinomas are cauterized by the latter methods. Most of these cases can be handled very nicely under local anesthesia. The cauterization is followed later by radium into the cavity, and if the local condition can be controlled, an excision of the glands of the neck is done. The sarcomas, when well localized, are treated in the same way. Radium is emphasized in the treatment of these. If very extensive, radium alone is the treatment of choice, as there is little to be gained by surgery.

RICKETS AS INFLUENCED BY THE DIET OF THE MOTHER DURING PREGNANCY AND LACTATION *

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During the last few years of active investigation into the etiology of rickets, attention has been centered on the nutrition and environment of the infant. Incidents connected with the nutrition of the fetus have received increasingly less attention as the importance of light and diet during the postnatal period have become evident. There have been some exceptions to this rule, notably the investigations of Korenchevsky [1] in the experimental field of rickets. A perusal of the publications of some of the older writers, of Glisson, and of numerous eminent clinicians of the latter half of the past century, illustrates how much greater significance was formerly attributed to hereditary and congenital factors. In view of our newer knowledge, it seemed as if this aspect of the etiology should be reconsidered from both a clinical and experimental point of view.

THE INFLUENCE OF HEREDITY

The most strenuous exponent of the rôle of heredity has been Siegert,[2] who about twenty years ago made a

* From the Department of Pathology, Columbia University College of Physicians and Surgeons.

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1. Korenchevsky, V., and Carr, M.: The Influence of the Mother's Diet During Pregnancy and Lactation upon the Growth, General Nourishment and Skeleton of Young Rats, J. Path. & Bacteriol. 26: 389 (July) 1923.

2. Siegert, F.: Die Erblichkeit der Rachitis, Jahrb. f. Kinderh. 58: 864, 1903.

careful study of numerous families, of parents and children, in which rickets was either notably present or absent. As the result of a clinical examination of two generations, he came to the conclusion that heredity was "probably the most important etiologic factor" in relation to this disorder. Such a conception presupposes the action of a true hereditary factor affecting the germ plasm in such specific fashion that a generation later the defect is transmitted to the fetus. In spite of the sincerity of this study, it is impossible to evaluate it on account of lack of information in regard to several crucial points. For example, no consideration whatever was given at that time to the degree of sunlight provided for the infant—a factor quite capable of turning the scale for or against rickets. Today we are all agreed on the importance of light in the etiology, and any investigation in which this factor has not been controlled cannot be intelligently appraised and, therefore, must be left out of consideration.

Recently, Byfield and Daniels [3] have expressed a similar opinion regarding heredity, in a paper presented before this section. As the result of feeding experiments on two or more generations of rats, they stressed "the dominating importance" of the diet in the second or succeeding generations. In our opinion the experiments of these authors do not bring support to the theory of heredity as propounded by Siegert, Marfan and others; namely, of rickets as a disorder affecting the germ plasm. In order to furnish satisfactory experimental evidence in this regard, the diet of females who have suffered from rickets in early life should be adequate during the entire period preceding pregnancy; otherwise we may be considering the effect of gradual impoverishment of one or more nutritional factors rather than of true heredity.

Clinical experience is opposed to the influence of heredity in rickets, if we understand by this term what Siegert did; namely, that, irrespective of the diet of the mother throughout adult life, the occurrence of rickets in infancy leads to later development of rickets in the offspring. Some years ago, one of us [4] made a careful inquiry into the incidence of rickets in the islands of the West Indies, and obtained a unanimous report from physicians in various cities of this district to the effect that rickets was almost nonexistent among the negro and white population in this geographic area. This report has since been confirmed by other observers. On the other hand, testimony is likewise unanimous that among the infants of these West Indian negroes who have migrated to the United States, rickets is exceptionally prevalent. In the study that was made among a negro community in New York City, rickets was found almost universal among the infants even of recent immigrants.

Here, then, is an instance in which heredity could not have played a rôle; in fact, one in which, if heredity were a dominating factor, we should have encountered a community that was exceptionally free from rickets. The same observation is pertinent in relation to rickets among the Italians. In southern Italy and Sicily, while rickets no doubt exists, it is mild and infrequent. On the other hand, among the southern Italians and Sicilians who come to New York and other large urban centers throughout the United States, it is exceptionally prevalent, even among the breast-fed, as pointed out by Snow some years ago,[5] and corroborated by all who have considered this subject. Indeed, it would seem that instead of precedent rickets in the mother tending to rickets in the offspring, just the reverse is the case, and that races which have not been subject to this disorder are particularly susceptible when they migrate to countries in which rickets is prevalent.[6] In the United States, the negroes, Italians, Greeks and Syrians seem to be most susceptible to rickets. As regards the negro, this susceptibility is due in part to the pigment of the skin, which filters out the ultraviolet rays; however, racial peculiarity may also play a rôle.[7]

THE CONGENITAL FACTOR

The congenital factor has to be considered in relation to the eitology of rickets quite apart form heredity. It is evident that, owing to nutritional errors of the mother, or other causes, the infant might be born with rickets or with a tendency to develop this disorder. Kassowitz, one of the best students of this disease, believed that most cases are of congenital origin, basing this opinion on the pathologic changes in the bones. It is hardly necessary to analyze Kassowitz's evidence in this connection, as his histologic criteria of rickets have been found to be unsound. Schmorl [8] failed to find histologic evidence of rickets in the new-born in the course of a routine examination of some hundreds of cases, and Wieland [9] showed that bones manifesting craniotabes do not present the histologic evidences—osteoid, etc.—that are considered pathognomonic of rickets. In spite of these studies, it must be borne in mind that diagonstic criteria are not fixed and immutable, but change with new conceptions of disease. This is true of pathologic, clinical and chemical criteria. For example, were our conception of the pathology of rickets to broaden so as to include certain forms of osteoporosis, it would be necessary to reconsider the evidence from this new point of view. The roentgen ray, which has been so helpful in furthering our knowledge of rickets, has failed to disclose definite instances of congenital rickets. Recently we have roentgenographed the epiphyses of 250 new-born infants; and, although in a few instances the picture was questionable, in no instance was there a frank and unequivocal picture of rickets. Furthermore, chemical analyses of the blood of the new-born, as recently carried out by Hess and Matzner,[10] have not shed light on this question. No relationship was found between the content of calcium or inorganic phosphorus in the blood of the new-born infant and a subsequent tendency to develop rickets. Some infants with a low percentage of inorganic phosphorus in the blood failed to develop rickets in the course of the winter, whereas, on the other hand, some with a high inorganic phosphorus content did develop rickets during the first year of life. Clinical signs afford less information regarding the

3. Byfield, A. H., and Daniels, A. L.: The Rôle of Parental Nutrition in the Causation of Rickets, J. A. M. A. **81**: 360 (Aug. 4) 1923.

4. Hess, A. F., and Unger, L. J.: The Diet of the Negro Mother in New York City, J. A. M. A. **70**: 900 (March 30) 1918.

5. Snow, I. M.: Explanation of Great Frequency of Rickets Among Neopolitan Children in American Cities, Arch. Pediat. **12**: 18, 1895.

6. The difference in etiology between rickets and dental caries is brought out by a consideration of these two disorders in Jamaica. As stated, rickets is practically nonexistent on this island. Recently, Dr. A. E. Vipond was kind enough to investigate for me the incidence of dental caries in Jamaica. He found that the teeth of the population in the rural districts were sound and strong. In the city of Kingston, on the other hand, dental caries was very common, although infantile rickets was rare and mild.

7. If the relative susceptibility of the negro to rickets is due entirely to integumentary pigment, the factor of light is thereby accorded a dominating position.

8. Schmorl, G.: Ergebn. d. inn. Med. u. Kinderh. **4**: 403, 1909.

9. Wieland, E.: Zur Frage der Angeborenen und hereditären Rachitis, Ergebn. d. inn. Med. u. Kinderh. **6**: 64, 1910.

10. Hess, A. F., and Matzner, M. J.: Rickets in Relation to the Inorganic Phosphate and Calcium in Maternal and Fetal Blood, Am. J. Dis. Child. **26**: 285 (Sept.) 1923.

occurrence of congenital rickets than a consideration of the pathologic changes, of the roentgenographic picture, or of the chemical examination of the blood.[11]

In this connection it would be interesting to ascertain how often women suffering from osteomalacia give birth to infants with congenital rickets. Unfortunately, there are no data on which to base an opinion in this regard. At present, osteomalacia is a disease which is so rare in civilized communities that it is difficult to obtain accurate and reliable information regarding both mother and child, and a perusal of the literature has not brought to light information of value. The accounts regarding the nutrition of the offspring are rare and vague at best. There are still a few centers where osteomalacia is endemic—notably certain districts in China and Japan, as well as India and Persia—and it is quite probable that a study of this question with modern methods may furnish data of value on this aspect. There is little probability, however, that such studies can be sufficiently well circumscribed to shed light on the rôle of true heredity in relation to rickets.

The main interest in connection with congenital rickets is not associated with the occurrence of fully developed cases, but rather with latent and undeveloped forms, such as are not recognizable by the various diagnostic methods at our disposal. In this regard rickets, no doubt, resembles scurvy and other disorders of nutrition, in which the mild undefined cases are far more numerous than the florid cases, which have taken many months to develop from a disorder characterized merely by disturbed metabolism to one in which tissue changes are present. Quantitative analyses of the organs of the new-born, especially of their mineral content but perhaps also of their organic constitution, may throw light on the occurrence of such incipient cases.

The weightiest argument in favor of a congenital factor in the etiology of rickets is the circumstance, noted ever since this disorder has been the subject of study, that it occurs with exceptional frequency and in exaggerated degree in premature infants. To such an extent is this true that, in our experience, cod liver oil frequently fails to protect such infants even when it is administered in the first weeks of life; although, it may be added, ultraviolet radiation is generally capable of conferring protection. The proneness of twins to rickets, a susceptibility which, although definite, is far less marked, is a clinical phenomenon which points in the same direction. It would seem that such susceptibility constitutes an incontrovertible argument in favor of the occurrence of congenital rickets if we include within this term a congenital tendency to develop rickets. If this is true of infants born prematurely, it is logical to believe that infants born at term may suffer in minor degree from the same deficiency to which the premature infant is subject.

It is, indeed, remarkable that fully developed rickets is not found frequently in the new-born infant. When we reflect that two of the conditions that greatly favor the development of this disorder are darkness and rapidity of growth, or metabolic rate, and that these two conditions are present throughout intra-uterine life in most marked degree, it is surprising that under such adverse conditions rickets does not develop in the course of the long period of pregnancy. It is a period of most rapid growth, taking place in an environment absolutely devoid of light. That normal growth and metabolism can take place under such conditions would seem to emphasize the superior efficiency of nutrition by way of the placenta as compared with that carried out through the agency of the alimentary tract.[12]

11. Beading of the ribs is not uncommon in the new-born, and must not be accorded the significance which this sign possesses in later infancy. Bowing of the legs is also frequently present and, as stated elsewhere, a fitness of the skull in the first weeks of life is not to be regarded as rachitic.

ORIGINAL INVESTIGATIONS

In considering the question of influence of the diet of the mother on the subsequent development of rickets in her offspring, it is necessary to distinguish three distinct periods in the life of the mother: first, that which precedes the onset of pregnancy; second, the period of pregnancy itself, and third, the postnatal period of lactation, during which the young may be fortified or retarded by the nutrition of the mother. Furthermore, it must be borne in mind that the nutrition throughout any two or all these periods may be at fault, and finally that the susceptibility of the young might be affected by conditions persisting through more than one generation.

For the last two years we have conducted a series of animal experiments arranged so that they might elucidate the rôle of maternal nutrition during these periods in its relation to the occurrence of rickets in the young. In regard to cod liver oil, it had been shown in a previous communication that the feeding of this specific to rats throughout pregnancy was incapable of protecting their young against rickets when they were later placed on rickets-producing dietaries.[13] During the last year, we have had a similar experience in relation to infants. A considerable number of pregnant mothers attending the Sloane Hospital for Women were given cod liver oil during the last two months of pregnancy, in order to determine whether by this means the development of rickets in the babies could be prevented in the course of the subsequent winter. It was difficult to carry out this program, as some of the women refused to cooperate and others did not tolerate the oil. Out of a large number of cases in which this prenatal therapy was attempted, there were twenty-eight patients who took 16 ounces (475 c.c.) or more cod liver oil during this period of pregnancy. Of this number, fifteen had babies that developed rickets by February or March according to clinical criteria, and eight as judged by the roentgenographic picture. The data of this group are given in Table 1. It will be seen that almost all these mothers nursed their babies for three months, and several for more than six months, so that, in addition to the possibility of supplying the active principle of the oil to the fetus, it might have been furnished to the infant through the milk. This failure to prevent the development of rickets in infants as well as in animals by giving cod liver oil to the mother during pregnancy leads to the conclusion that although this oil may exert some therapeutic effect on the infant when given vicariously in this way, it does not constitute an effective method of combating rickets. Furthermore, according to our experience, the active principle of cod liver oil is not excreted into the milk in amount sufficient to afford protection. This conclusion was based on experiments which showed that in spite of the fact

12. Rate of growth and of metabolism is frequently the deciding factor in connection with the production of rickets in animals. Its significance is well illustrated by the fact that the giving of thyroid gland will hasten the development of rickets (Mellanby, E.: The Rickets-Producing Effect of Dried Thyroid, J. Physiol. 58: 2, 1922). Furthermore, cretins have a lessened tendency to develop rickets, and, on the other hand, when they are given thyroid gland this diminished susceptibility is changed to a heightened susceptibility which is so marked as to make it desirable to protect them by means of cod liver oil (Thomson, J.: Thyroid Treatment of Cretins, Brit. M. J. 1: 615, 1896).

13. Hess, A. F., and Weinstock, Mildred: Antirachitic Effect of Cod Liver Oil Fed During the Period of Pregnancy and Lactation, Am. J. Dis. Child. 27: 1 (Jan.) 1924.

that rats were fed throughout lactation what must be regarded as maximal amounts of cod liver oil, their young subsequently developed rickets, as judged by roentgenographic, pathologic and chemical criteria. It is evident that the antirachitic factor is not secreted into the milk to the same degree as the three well established vitamins.

The dietary experiments carried out on rats for the three distinct periods (*a*) prepregnant, (*b*) pregnant and (*c*) lactating, were conducted as follows: Rats were bred in the laboratory from our own and other known stocks, and the young were allowed to suckle for twenty-eight days, after which period they were placed on a rickets-producing diet for a period of twenty-eight days; they were then roentgenographed and killed for gross and microscopic examination of the epiphyses. In connection with the feeding of the dams, two diets were employed, the one termed "standard," which refers to the standard dietary of the laboratory, which is liberal but which experience has demonstrated is not fully adequate. It is composed of dry milk given three times, greens twice, meat once, bread or potato twice a week, and whole grains daily. Although this dietary may seem

TABLE 1.—*Subsequent Development of Rickets in Infants Whose Mothers Had Been Given Cod Liver Oil During Pregnancy*

Case	Race	Birthplace of Mother	Amount of Cod Liver Oil, Ounces	Age of Infant, Months	Nursed, Months	Rickets	
						Clinical	Roentgen Ray
B. E.	Negro	British West Indies	16	6	3	R.	Slight
R. D.	White	Greece	16	9	3	R.	Healed ?
A. R.	White	United States	16	8½	8½	R.	No
S. C.	White	Italy	16	10	10	R.	Moderate
A. F.	White	.....	16	7	3	R.	?
J. C.	White	.....	16	6	6	R.	No
L. N.	Negro	British West Indies	16	8	8	R.	Moderate
R. H.	White	.....	16	9	0	R.	Slight
L. H.	White	.....	16	7	3	R.	No
R. L.	Negro	United States	16	9	3	R.	Marked
A. R.	Negro	United States	16	7	7	R.	Moderate
B. C.	Negro	United States	16	5	3	R.	No
C. B.	White	United States	16	9½	8	R.	No
L. J.	White	United States	32	7	2	R.	No
F. B.	White	.....	32	8	0	R.	Moderate

adequate, it fails to induce optimal growth and fecundity. It is probable that many diets which at present are regarded as adequate for man or animals will similarly be found deficient in one or more respects. We wish, however, to emphasize the point that throughout these experiments the rats which received the inadequate diet were being given a "standard" ration and by no means a starvation or highly defective diet. The degree of inadequacy was very moderate, and probably approximated what might be encountered among women under unfavorable social conditions. The "supplemented" diet was enlarged to such an extent as to make it unquestionably complete; green food, bones, meat or brain, dry milk, and whole grains were fed daily, and bread or potatoes occasionally, thus assuring a plentiful supply of the various vitamins as well as of calcium, phosphorus and other salts. In view of the fact that we possess almost no knowledge regarding the comparative antirachitic value of various foods, it seemed that the safest way to insure a complete dietary was to make the ration varied and abundant.

In the first experiment (Table 2), the diet of the dam was supplemented previous to and during lactation, but consisted of the "standard" ration during pregnancy. The young of these dams were placed either on the Sherman-Pappenheimer low phosphorus diet (No. 84), or on one in which 5 per cent. of the flour in this dietary is replaced by dried milk, prepared by the roller process. The 5 per cent. dry milk diet, which we have found very serviceable, was employed because it was feared that Diet 84 might constitute too severe a test and be too

TABLE 2.—*Effect on the Development of Rickets in the Young of Supplementing the Diet of the Mother Rat During (A) Pregnancy or (B) Lactation*

A. DIET OF DAM SUPPLEMENTED (OPTIMAL) PREVIOUS TO PREGNANCY AND DURING LACTATION, AND STANDARD (INADEQUATE) DURING PREGNANCY

Stock	Experiment No.	Litter: Size	Litter: Number Used	Weight Averages, Gm.	Rickets Diets	Roentgenogram
D.	56	6	5	46-47	84	Marked rickets
				45-52	5% dried milk	Marked rickets
	57	3	3	74-87	84	Marked rickets
	58	5	5	80-100	84	Moderate rickets
				80-132	5% dried milk	Marked rickets
	62	9	9	52-60	84	Marked rickets
				57-85	5% dried milk	Marked rickets
	65	5	5	66-71	84	Moderate rickets
				65-90	5% dried milk	Moderate rickets

B. DIET OF DAM SUPPLEMENTED (OPTIMAL) PREVIOUS TO AND DURING PREGNANCY, AND STANDARD (INADEQUATE) DURING LACTATION

D.	26	9	9	34-39	84	1 slight rickets 4 moderate rickets
				46-55	5% dried milk	4 marked rickets
	36	5	2	42-43	84	2 marked rickets
	37	9	6	35-38	84	1 slight rickets 5 moderate rickets

productive of rickets. As indicated in the table, the young rats were not protected from rickets by supplying the dams with the full diet previous to pregnancy and throughout lactation. The weights of the young at twenty-eight days were unusually large, as high as 80 gm., whereas on the standard diet the average weight is 35 to 40 gm. at this age. This increased growth is probably due to the fact that the young partake of the mother's food during the latter half of the suckling period, and emphasizes the essential difference between increase in growth and resistance to rickets. This result

TABLE 3.—*Diet of Dam Supplemented (Optimal) During Pregnancy and Lactation and Standard (Inadequate) Previous to Pregnancy*

Stock	Experiment No.	Litter: Size	Litter: Number Used	Weight Averages, Gm.	Rickets Diets	Roentgenogram
O.	45	7	6	78-89	84	2 moderate rickets 1 marked rickets
				78-98	5% dried milk	1 moderate rickets 2 marked rickets
	64	9	9	65-72	84	1 moderate rickets 4 marked rickets
				67-93	5% dried milk	1 moderate rickets 3 marked rickets
F.	19	8	7	46-44	84	4 slight rickets 3 negative ?
	21	8	5	33-37	.....	4 slight rickets 1 moderate rickets
	29	4	3	44-50	.....	1 slight rickets 2 moderate rickets

accords with the clinical experience that nursing infants may develop rickets in spite of the fact that their mothers are consuming an adequate diet. Recently we had under observation a baby which developed moderate rickets in spite of the fact that it was being nursed by a woman who drank two quarts of milk and ate meat and green vegetables every day.

In the next test, the program was altered so that the dams received the inadequate "standard" ration only

during lactation, and the full diet during the two other periods. This experiment comprised three mother rats and seventeen young of the same stock as was used in the previous test. It will be noted in Table 2 *B* that rickets once again developed in the young. Korenchevsky has particularly stressed the importance and value of a complete dietary during pregnancy, believing that it provided a store of the fat-soluble factor for the young, thus protecting them against rickets-producing influences in postnatal life.

In the following experiment, the order was again varied, the supplemental periods being pregnancy and lactation: Five dams of two different stocks were used, having thirteen young in all. The rickets was somewhat less under these conditions, but, it will be noted, was at times moderate or even marked (Table 3). When the supplemental diet was fed throughout all three periods—to seven dams with forty-three young—there was likewise a lessened degree of rickets in the young, but complete protection was by no means afforded (Table 4).

In view of the importance attached to an adequacy of diet extending through more than one generation, the supplemental diet was supplied throughout two generations. For this purpose a dam was selected of the same stock in which partial resistance had been brought about by a complete diet during the periods of pregnancy and lactation or throughout all three nutritional periods. This led to the production of a strong and vigorous litter of rats, which, however, proved to be markedly susceptible to rickets (Table 5). It will be noted that these rats were exceptionally heavy, and their lack of resistance may have been closely associated with their rapid growth previous to having been placed on the experimental dietary. In this connection it may be added that all rats were kept in the same room, which was at all times dark, in order to obviate the protective factor of even a minor degree of light.

TABLE 4.—*Diet of Dam Supplemented (Optimal) Throughout the Three Periods; Previous to Pregnancy, During Pregnancy and During Lactation*

Stock	Experiment No.	Litter: Size	Litter: Number Used	Weight Averages, Gm.	Rickets Diets	Roentgenogram
S.	49	5	5	43-53	84	4 slight rickets 1 moderate rickets
	49	6	6	42-49	.....	6 slight rickets
P.	16	10	4	37-37	84	3 slight rickets 1 moderate rickets
	17	8	8	50-56	.....	2 slight rickets 6 moderate rickets
	20	4	4	46-49	.....	4 slight rickets
	23	10	6	58-70	.....	1 slight rickets 2 moderate rickets 3 marked rickets
	24	10	10	42-48	.....	4 slight rickets 3 moderate rickets 3 marked rickets

These experiments would seem to indicate that it is not possible to render rats absolutely refractory to rickets by means of supplementing the diet of the mother. It must not, however, be assumed that the contrary holds true and that resistance cannot be broken down by this means. It may be stated as a principle that resistance to rickets can be lessened by means of inadequacy of a mother's diet far more readily than a refractory condition can be brought about. The distinction between these two points of view should not be lost sight of in considering the relation of diet to rickets either in animals or in man. The fact that susceptibility to rickets may be induced by an inadequacy of the maternal diet does not warrant the conclusion which has at times been drawn that it is likewise possible to render the young resistant by fortifying nutrition during the prenatal period.

Clinical experience furnishes strong evidence against the premise of Siegert [2] and of Korenchevsky [1] that the etiology of rickets is essentially prenatal. Opinion is unanimous that rickets is far more common and severe among bottle-fed than among breast-fed babies;

TABLE 5.—*Two Generations of Supplemental (Optimal) Diet*

Stock	Litter: Size	Litter: Number Used	Weight Averages, Gm.	Rickets Diets	Roentgenogram
F.	7	6	56-64	84	Moderate rickets
			60-64	.....	Moderate rickets
			70-74	.....	Marked rickets
			60-90	5% dried milk	Marked rickets
			56-84	.....	Marked rickets
			72-94	.....	Moderate rickets
F.	10	10	60-64	84	Marked
			60-54	.....	Marked
			44-54	.....	Marked
			52-60	.....	Marked, very slight healing
			55-60	.....	Marked
			50-64	5% dried milk	Marked (slight healing)
			60-76	.....	Marked (moderate healing)
			60-70	.....	Marked (moderate healing)
			64-84	.....	Marked (moderate healing)
			54-68	.....	Marked (slight healing)

this is true throughout the world and among all races. Furthermore, pathologists and clinicians have demonstrated time and again that rickets has a seasonal incidence, with its peak in the winter and early spring and its ebb during the summer months. Both of these manifestations, the one dependent on diet, the other on climate, must be ascribed to postnatal factors. Neither can be considered as of secondary importance. The difference between the breast-fed and the bottle-fed infant in regard to rickets is too marked to be attributed to a minor influence. The seasonal factor—due mainly to variations in the ultraviolet rays—dominates the etiologic picture of rickets to such an extent as practically to do away with the occurrence of this disorder during the summer months.

CONCLUSIONS

Judging from our experiments, it would seem that rickets cannot be prevented by improving the diet of the mother, (*a*) previous to pregnancy, (*b*) during pregnancy and (*c*) throughout lactation, although it can be mitigated to a certain degree. Supplementing the diet of the mother for two generations also failed to render the young refractory.

Infants were not protected by giving the mother cod liver oil during the last two months of pregnancy.

On the other hand, the fact that premature infants are markedly susceptible to rickets shows that prenatal nutrition does play a rôle.

A consideration of the experimental evidence, of clinical tests, of the susceptibility of bottle-fed compared to breast-fed babies, and the striking seasonal incidence leads to the conclusion that rickets is mainly of postnatal origin. Although its incidence and severity may be influenced by improving the nutrition of the mother, our main efforts should be directed toward improving the environment and nutrition of the infant. Until these postnatal factors are corrected, we cannot hope to prevent rickets.

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CORRELATION OF CLINICAL, ROENTGENOLOGIC AND SEROLOGIC EVIDENCES OF RICKETS IN BREAST-FED*

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The clinical signs of rickets have been familiar to observers for many generations, and up to a half decade ago constituted the sole diagnostic criteria for the clinician. There have recently been added to our knowledge the characteristic roentgenographic picture and the chemical changes in the blood.

Many of us, no doubt, have encountered certain cases presenting some evidences of rickets, but we have been in doubt as to the actual presence of the disease. Particularly is this true of the breast-fed baby, reared in healthy surroundings, with every possible comfort, and whose nutrition seems to be beyond criticism. Indeed, we have never been sure just which clinical signs, if any, were infallible as diagnostic points of the disease.

It is generally believed that, in the absence of scurvy, beading of the ribs is the earliest and most reliable sign, while there are many who attach to craniotabes a pathognomonic significance. Enlargement of the epiphyses has been recognized as one of the important changes, but it was thought to be present only after the disease had well progressed. The later changes are too well known to be dealt with here.

That the roentgen-ray evidence of rickets is entirely reliable we can state with fair certainty, though in many instances the clinical signs precede the changes in the epiphyses of the long bones as seen in the roentgenogram, because, as Hess has pointed out, the changes at the costochondral junction occur earlier than those in the epiphyseal ends of the radius and the ulna.

The blood chemistry of rickets that we are now all familiar with consists in a marked reduction in the inorganic phosphate of the plasma and a very slight or no reduction in the calcium, the product of the two furnishing an important index. The phosphate normally is present in a concentration of 5 mg. per cent., and the calcium, 10 mg. If the phosphate level falls to, say, 2.5 mg. and the calcium remains at 10 mg., the product will be 25. A low product is usually indicative of rickets. Howland, for example, believes that a product under 30 always means active rickets.

In this study, carried on in the newly born outpatient service of Touro Infirmary, we have attempted to determine which of the clinical signs of rickets are the reliable diagnostic ones. We have examined each infant for bosses, craniotabes, flaring ribs, beading, enlargement of epiphyses, and bowed legs, in addition to roentgenographing the wrists and determining the phosphate and calcium of the blood plasma. A total of sixty-eight infants was thus studied, ranging in age from 4 weeks to 44 weeks.

METHODS

The clinical signs were graded as ±, +, + ± (one and one half plus) + +, etc., examinations being made by one of us and checked by the other. The roentgenograms were taken of the wrists. Blood was withdrawn from the longitudinal sinus into sodium citrate (about 0.1 gm. for 10 c.c. of blood) and centrifugated usually within one hour after withdrawal. The inorganic phosphate was determined by Brigg's modification of the Bell Doisy method.[1] Calcium was determined by the Kramer method.[2]

FINDINGS

In the sixty-eight infants in the study, there were fifty-six observations, which included clinical examinations, roentgenographic picture and blood chemistry. All the cases in this study were arranged in an ascending scale of the product (calcium × phosphate) and were divided into three groups as follows:

Group A included products ranging from 18 to 30. The phosphates in this group showed a greater relative reduction than did the calciums. In 46 per cent. of the cases of this group, the calciums were definitely reduced below the normal.

Group B included products from 31 to 45. Only 26 per cent. show a phosphate below the normal; 52 per cent. of the calciums were below the normal, and the 52 per cent. were cases other than the low phosphates.

Group C included products from 45 to 62.8, inclusive. In this group, all calciums and phosphates were normal.

In Group A the roentgenographic examination showed marked changes in 42 per cent., and in all positive evidence of rickets. In one instance, no roentgenogram was taken. In Group B, 14 per cent. were marked cases of rickets; 35 per cent. showed evidence of rickets, and 50 per cent. were negative. In five instances there were no roentgen-ray examinations. In Group C, eight cases, or 26 per cent., showed evidence of rickets, all of which, with one exception, were either healing or healed.

The total pluses recorded in the clinical symptoms ranged in individual cases from 0 to 8½. According to groups, the total number of pluses in the Group A numbered 89, in thirteen cases, or an average per case of 6.8 pluses; in Group B there was a total number of 69½ pluses in nineteen cases, or an average of 3.6 pluses per case; and in Group C a total of 113 pluses in thirty-six cases, or an average of 3.1 pluses per case. In this group, however, there were seven cases of residual rickets whose total pluses numbered 40½, averaging 5.5 pluses per case. Exclusive of these cases there was a total of 72½ pluses in twenty-nine cases, averaging 2.5 pluses per case.

It is of interest to note that, in the positive cases as shown by the roentgen ray in the group whose products ranged from 31 to 40, inclusive, within limits considered as suggestive of rickets, there was an average of 4.7 pluses in clinical symptoms per case. It would seem, therefore, that with a clinical finding of 4.5 pluses or more, any given case should be considered as probably rachitic.

From the roentgenographic study, the cases were divided into normal and abnormal groups. The normal groups included all the negative findings. The abnormal group was divided into active and inactive rickets. A further subdivision was made in the active group; namely, positive and marked positive rickets. The inactive group comprised the healing and healed cases.

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* Read before the Section on Diseases of Children at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

1. Briggs, H. P.: A Modification of the Bell-Doisy Phosphate Method, J. Biol. Chem. **53**: 13 (July) 1922.
2. Kramer, B., and Tisdall, F. F.: A Simple Technique for the Determination of Calcium and Magnesium in Small Amounts of Serum, J. Biol. Chem. **47**: 475 (Aug.) 1921.

In the marked group, all severe cases had abnormal phosphates and low products. In 86 per cent. in this group, the phosphate level was below normal.

There were eleven cases in the positive group, and in only three cases was the product above 35. In 73 per cent. of the cases in this group, the phosphate level was below normal.

The healing and healed groups, comprising nine cases, had calcium-phosphate products which were normal with one exception.

In the normal group, all the serologic examinations were negative. In studying the combined observations, it is seen that the lower the product (calcium × phosphate) the higher the percentage of positive roentgen-ray and clinical findings.

Arranging all cases in age groups as follows: 4 to 8 weeks, 8 to 12 weeks, 12 to 16 weeks, etc., it was noted that up to the twelfth week the average phosphate and calcium figures were normal, with slight variations in the calcium but with a remarkably constant phosphate level in all cases. After the twelfth week, we found the first evidences of rickets in the blood. The blood of one of the 12 weeks old infants showed a phosphate of 2.5 mg., which was one of the lowest figures obtained in the study. The average product of this group of nine cases was 30.4, which is at the minimum for rickets. It should be stated that the cases which go to make up this study were largely selected from the clinic of the newly born because there existed clinical evidences of rickets, some cases having been selected as controls. These age groups, therefore, do not represent the normal run of infants. The averages of the 16 to 20 weeks old infants were essentially the same as those of the 12 to 16 weeks, while after the twentieth week we noted a tendency to a return to the normal.

We have arranged all the bloods by months beginning in November, 1923, and extending through March, 1924. The November group showed average normal figures; viz., phosphate, 5.3 mg.; calcium, 9.6 mg.; product, 50.8 in eight cases. In December we noted a tendency for the phosphate to diminish, 5.0 mg., while the calcium average remains unchanged, 9.6 mg. in twenty-one cases. In January and February there was a distinct lowering of the phosphate level to an average of 4.5 mg. in seventeen cases in January, and 4.4 mg. in eleven cases in February. The calcium remained essentially unchanged and the product was definitely below that for November, the average of the seventeen January cases being 37.4. In March, the lowest levels were reached for both the calcium, 8.5 mg., and phosphate, 3.3 mg., with an average product distinctly that of rickets, 28. This monthly variation corresponds closely with the observations of Hess and Lundagen on the seasonal variation of the blood phosphate.

The white and colored infants' bloods have been considered separately. There were twenty white and forty-eight colored babies. The general average for the white infants was normal; phosphate, 5.1 mg.; calcium, 9.7 mg.; product, 49. The general average for the colored infants shows lower figures for both phosphate, 4.2 mg., and calcium, 8.9 mg., and a product approaching that of the rachitic blood, 37.4. In order to make a fairer comparison, figures for the bloods of twenty colored infants of approximately the same ages as the white infants were selected and averaged. They were: phosphate, 4.8 mg.; calcium, 8.6 mg.; product, 41, which averages were still below those of the white infants.

In this study, sixty-eight breast fed infants were examined for evidences of rickets by clinical, roentgenographic and blood chemistry observations.

The blood calcium ranged from 6.1 mg. to 11.3 mg. per cent., and the phosphate from 2.3 to 6.1 mg. per cent. The product of these two ranged from 18.6 to 62.8; when the product was above 34.5 the figure for the phosphate was always normal or above. It was noted that the lower the product, the more frequently were the roentgen-ray findings positive, and the greater was the degree of clinical evidence of rickets.

The positive roentgenographic findings, the positive clinical manifestations, and the abnormal blood changes ran parallel.

A few cases in which there was marked disagreement between positive clinical signs and negative blood findings were attributed to residual rickets after cod liver oil administration.

Epiphyseal enlargement impresses us as being the most dependable clinical manifestation of rickets. Costal beading appears to be the symptom next in order of importance. Whereas craniotabes occurs regularly in those cases with a low product, it also appears so often and in such marked degree in cases with normal blood and roentgen-ray findings as to be unreliable if considered alone. Moreover, this symptom is not dependable because of its appearance, as a rule, at an early age and because of its short duration.

Cranial bosses, flaring ribs and bowed legs must be regarded as later changes that result from rickets.

It can be stated that within the first twelve weeks of life the blood analysis does not show any changes indicative of rickets.

From the twelfth to the twentieth week, the blood changes are more pronounced, and after this period there is a gradual return to normal.

The seasonal variation of the blood phosphate is noted, the lowest average occurring in March.

This study shows the greater intensity of rickets in the colored race as compared with the white.

Finally, we believe that serologic examination for rickets is the most reliable procedure for determining the activity of the disease; but it is not always of practical application. Positive roentgenographic evidence is of decided value in the diagnosis of the disease. The necessity for the diagnosis of rickets from its clinical manifestations must not be lost sight of, but it must be emphasized that the most dependable of the clinical symptoms are epiphyseal enlargement and costal beading.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. MOORE, FINDLAY, WYMAN AND WEYMULLER, HESS AND WEINSTOCK, AND DE BUYS AND VON MEYSENBUG

DR. H. J. GERSTENBERGER, Cleveland: During the last nine years I have had occasion to come directly or indirectly into contact with infants numbering into the thousands who have been fed cod liver oil as a part of their daily food, and I have yet to see the first case of rickets as checked by the roentgen ray and by the calcium and phosphorus content of the blood serum, even though some of the infants were continued on this mixture for over a year indoors. I have, however, seen rickets develop in an infant who received a liberal amount of cod liver oil, but its diet was abnormally

* The papers by Dr. A. F. Hess and Miss Mildred Weinstock and by Drs. L. R. DeBuys and Ludo von Meysenbug, together with the discussion, complete the symposium on rickets. The papers by Drs. C. U. Moore, Leonard Findlay and E. T. Wyman and C. A. Weymuller appeared last week.

high in protein. A certain proportion between the two seems important. From the standpoint of preventing rickets in infants, I believe that sufficient emphasis is not being placed on the responsibility of the climatic factors. In order to get the cooperation of the public, it is essential that the rôle played by climatic factors be made clear. Rickets in infants, primarily, is a climatic disease and only secondarily a dietetic disorder. Human milk in our country, on the whole, must be a complete food, yet one cannot cure rickets with breast milk. It will appear in breast-fed infants during the winter, and also during the summer if the infants are kept within four walls. The diet will modify the course of rickets in infants, but will not prevent its development without the aid of the actinic rays or the factor in cod liver oil.

DR. JOHN HOWLAND, Baltimore: I have listened to Dr. Findlay's paper with great interest. We have argued this question before at considerable length. We agree on certain things and we disagree on others. Dr. Findlay cannot convince me and I cannot convince him. Doubtless the fault is mine for, perhaps, I am in the position of the man who said, "It is quite possible to convince me, but I would like to see the rascal who can do it." We agree on the question that cod liver oil and sunlight have taught us much, but that they have not taught us all the essential things. We agree on the matter of deficient absorption from the intestinal tract. Dr. Findlay believes that the deficient absorption of calcium is of most importance. I believe that the deficient absorption of phosphorus is of chief concern, for in uncomplicated rickets it is not the calcium that is deficient in the serum, but the inorganic phosphorus. We do not agree on certain points, such as the necessity of proving a negative balance of these elements by metabolism experiments in order to prove the presence of rickets. This would be very difficult to demonstrate with regularity, for rickets is not a progressive disease. There are exacerbations and remissions in the disease which cannot be recognized clinically but which can be proved post mortem by the presence of lines of calcification, which are in reality abortive attempts at healing. If there were a negative balance it would mean that rickets was tremendously active, for not only would the new bone formed be totally lacking in calcium and phosphorus, but these elements would also have to be removed from old bone already calcified. The bones would be constantly losing their solid material, and the pathologic changes would be extreme. We do not agree as to the effect of cod liver oil. I am inclined to regard cod liver oil as absolutely specific, as specific an agent as we have in the whole field of medicine. We have two criteria by which to judge of the presence of rickets and the efficacy of treatment: (1) the changes in the bones clinically and roentgenographically; (2) the reduction of the inorganic phosphorus of the serum. Both of these can be influenced by the use of cod liver oil, so that in the course of a few weeks profound alterations in the roentgenograms are made out and there is a return of the inorganic phosphorus to normal limits. That cod liver oil will not make a child walk immediately is quite true, but it will heal his bones and, assisted by massage and electricity, will enable him to walk. I should not like to see the medical profession give up again its belief in the efficacy of cod liver oil. Trousseau taught that it would cure all cases of rickets. The profession accepted this, but without enthusiasm, and gradually gave up the idea that cod liver oil was a specific for the disease. If one looks at the monographs of from ten to 25 years ago, one will find that cod liver oil is stated to accomplish something, but not much. Some authorities denied any virtue to it, and Cushny stated that its effect was due to its being a readily assimilable form of fat. We know now, however, that it is a substance of extraordinary power in the prevention or cure of rickets. Ultraviolet radiation will also accomplish this, but cod liver oil is so much simpler to give, and can be used with large numbers of patients so much more readily, that it is a more practical method of treatment, although ultraviolet radiation is of extraordinary scientific interest. I believe with Dr. Hess that the problem of rickets is not a prenatal, but a prophylactic, problem. Just as prophylactic treatment has lessened and will further lessen the incidence of congenital syphilis, so prophylactic treatment has diminished and will further diminish the number of rachitic children, especially those with marked deformity. We can look forward confidently to this in the future.

DR. LEONARD FINDLAY, Glasgow: Dr. Howland and I have crossed swords before on this subject. There is Scotch blood in both of us and we are both inclined to be pig-headed. However, there seem to me to be two big questions in the rickets problem, and just as Dr. Howland has said, they should be kept separate: (1) the cause of the disease, which is still unsettled but which, I hope, will be cleared up as the result of combined investigation all over the world; (2) its prevention. I wish that some conjoint board could congregate at one place where there are a sifficient number of cases, and that the cases could be studied to see wherein our views differ. The work of Dr. Hess suggests to me that the disease is not hereditary. (I do not believe that Dr. Hess and I understand exactly the same thing by the term "hereditary.") I understand Dr. Hess to state that the disease is a postnatal condition. By "hereditary" I mean a strain that is inherent in the stock and that cannot be modified from one generation to another. I think I should call this disease "congenital," not "hereditary." I don't think it is difficult to understand why premature children often have rickets. A child is born a month or more prematurely, and it comes into the world with poor calcium content in its body; therefore any defect of absorption will declare itself more readily, earlier and more markedly. Dr. Howland thinks that it is the phosphorus that is not absorbed. I think it is the calcium. One can use the arguments that he used against calcium and apply them against phosphorus. They hold just as well in one case as the other. I do not claim that my experiments are the last word on the subject, but when one does metabolism experiments and they do not prove what one wants them to prove, the thing to say is that the subjects were not the right type, and that one did not get them early enough. However, these cases showed by the roentgen ray definite progressive lesions. I naturally have paid more attention to the experiments I have been doing myself than to those going on in Baltimore. But in every case we have had a low calcium metabolism, although we have never had a negative balance. These experiments seemed to prove that calcium was not retained, but that phosphorus was, or how else was there so much phosphorus in the urine? Dr. Howland and I agree, and so, I think, does Dr. Hess, that rickets is a postnatal disease of an intestinal type. There is room for much work along these lines, but do not let us delay with prophylaxis. I do not agree with Dr. Gerstenberger that cod liver oil is an absolute specific. Certainly, in Glasgow it is not. Patients have received cod liver oil for a solid year and still have active rickets roentgenologically. It does not cure as rapidly as is generally supposed, but let us go on with cod liver oil and let us bring ultraviolet rays into the home; but neither of these things is really necessary. If I had the opportunity again to raise a family, I would do it without installing an ultraviolet ray apparatus in the nursery and without cod liver oil. This is a question of common sense and morale of the parents. We do not need accessories if fresh air and exercise are attended to. But let us go on investigating and let us get at the cause of the disease.

DR. C. ULYSSES MOORE, Portland, Ore.: The use of cod liver oil in infantile rickets has been more satisfactory with us for prophylaxis than for treatment. For example, in two families of three children each, cod liver oil given to the oldest ones after costomalacia and beading had appeared did not prevent rickets of the extremities. With the second children, cod liver oil was begun at 10 days of age. These children had better chests and legs than the older ones. During the third pregnancy, each mother received one teaspoonful of cod liver oil daily from the beginning of gestation. At 1 year of age, these last babies were much superior skeletally to the previous ones.

DR. ALFRED F. HESS, New York: With regard to one of Dr. Moore's signs, that of soft cartilages (costomalacia), it is my opinion that it is not a true sign of rickets. One may note a soft chest with compressibility of the cartilages, and yet there may be no sign of rickets. I have followed this question for some years, and have found costomalacia in

cases in which there were normal roentgenograms and also normal blood phosphorus. It does not yield to cod liver oil or to ultraviolet light therapy, but it may yield to phosphorus in almond oil without cod liver oil. I must disagree with Dr. DeBuys as to the significance of enlarged epiphyses, which he has designated as an early sign of rickets. This may be so in New Orleans, where cases are marked in the negro; but in New York enlargement of the epiphyses is not seen in many white babies, not nearly so frequently as enlargement of the costochondral junctions. In regard to Dr. Findlay's discussion of heredity, I think there is merely a difference in terminology. When we consider the germ plasm there is probably no such thing as heredity in rickets. I spoke of the influence of the congenital factor in babies, but that has nothing to do with the germ plasm. Rickets in the mother has nothing to do with subsequent rickets in the child. The significant point is that rickets in the mother and in the child have really no connection. Rickets is far more common here among the negro than among the white babies; but in the West Indies, there is no such disorder as rickets. Physicians practicing for many years in Jamaica, Barbados and Panama say that there is no rickets. But when the women come to New York from the West Indies and from southern Sicily and Italy, their children develop marked rickets. There is susceptibility in the infants where there was none in the mothers.

DR. L. R. DEBUYS, New Orleans: In reply to the remark of Dr. Hess relative to the symptom of enlarged epiphyses, I would say that the symptom was recorded by one of us in one room and confirmed by the other in another room, as were also the other symptoms, including costal beading. There is no explanation to offer with regard to our statements in connection with the enlarged epiphyses, but it should be emphasized that the severity of the symptom of enlarged epiphyses ran parallel with the serologic findings and the roentgen-ray findings.

INTRADERMAL SALT SOLUTION TEST IN SCARLET FEVER AND DIPHTHERIA PATIENTS*

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In July, 1923, McClure and Aldrich[1] reported that the elevation or wheal produced by the intradermal injection of 0.2 c.c. of an 0.8 per cent. solution of sodium chlorid disappeared much more rapidly in a group of children having edema than it did in a group of control cases. Later they[2] used the test in sixteen cases, in children, characterized by generalized edema, albuminuria, casts and in some cases red blood cells in the urine, and unassociated with nitrogen retention in the blood or evidence of cardiovascular disease. In these cases they found that, in a general way, the greater the edema the shorter was the disappearance time, and vice versa; that when tests were made in patients with developing edema, a reduction of the disappearance time preceded other clinical evidences of edema by several days. In certain improving edematous patients, they observed an increase of the disappearance time before the edema showed any apparent decrease. The authors state that in their observation an infection usually precedes or accompanies the clinical manifestations of this type of case, and that their results can be explained on the assumption that a general intoxication, resulting from infection, causes a change in the tissues, which increases their avidity for water and, since water is available, causes them to swell. They think it probable that the pathologic urinary findings in these cases appear only when the kidneys become sufficiently involved in this general process. They conclude that the test is a valuable method of determining the immediate prognosis and an aid in directing the therapeutic management in these cases, and that their results seem to substantiate the theory that the tissues, in this type of case, are active in the development of edema.

Using the technic as outlined by McClure and Aldrich,[1] an effort was made to determine whether there is any reduction in the disappearance time of intradermally injected salt solution in scarlet fever and diphtheria patients; whether this reduction, if present, parallels the severity of the intoxication; whether the disappearance time is of any prognostic value, and whether such observations can be used to indicate when a patient has returned to normal. Aldrich and McClure[2] had already found a shortened disappearance time in postfebrile scarlatina in the absence of pitting. They consider the normal time for children over 1 year of age to be over sixty minutes. My observation would seem to place the normal time between sixty and ninety minutes.

It was found that the scarlet fever cases could be divided into three groups with marked variation in their disappearance time. In the first group of six cases, the test was done during the first five days of the disease, or at a time when severe complications were present. These cases were of the toxic type, with nephritis present in most at the time of admittance, but at no time was there any palpable edema. The disappearance time ranged between three and thirty minutes, despite the absence of clinical edema. In two patients of this group, with normal urines, a nephritic urine was predicted when the disappearance time fell below twenty minutes. One of these developed an albuminuria with casts two days and the other three days afterward. Five days afterward the disappearance time of both was well above thirty minutes, and their urines were again normal.

In the second group of thirty patients tested during the first week of the disease, the disappearance time varied from thirty to fifty minutes. After a typical onset, these patients had a moderate exanthem, were moderately toxic, and were free from edema, and the urines were negative for albumin and sugar, and normal microscopically.

The third group of thirty-four patients included the convalescents and relatively normal individuals, tested twenty days or more after the onset of the disease. The disappearance time varied from fifty minutes to ninety minutes, depending on the severity of the case and the complications during convalescence. When a transient nephritis had previously occurred, the time seldom exceeded fifty minutes before leaving the hospital; milder cases reached from seventy to ninety minutes. Most of the patients left the hospital on the twenty-eighth day.

The two following cases indicate that the test may be of practical value in directing treatment. For example, in a nurse of the staff who had a toxic scarlet fever, the disappearance time during convalescence remained around forty-five minutes; on discharge from the hospital she was warned to be careful in her manner of living; she did not take heed, and one week after

* This work was done at the Annie W. Durand Hospital of the John McCormick Institute for Infectious Diseases under the auspices of the Otho S. A. Sprague Memorial Institute.

1. McClure, W. B., and Aldrich, C. A.: Time Required for Disappearance of Intradermally Injected Salt Solution, J. A. M. A. **81**: 293-294 (July 28) 1923.

2. Aldrich, C. A., and McClure, W. B.: The Intradermal Salt Solution Test, II, Its Prognostic Value in "Nephritis" with Generalized Edema, J. A. M. A. **82**: 1425-1428 (May 3) 1924.

leaving the hospital she developed arthritis and slight edema. In another instance, a mother brought her 8 year old son back to the hospital for observation two weeks after his dismissal; the disappearance time was thirty-five minutes, although the urine was normal; on the basis of the skin test, the mother was advised to keep the boy out of school a week for rest, and at the end of a week the disappearance time was around one hour; the lad was normal subsequently.

In pyelitis cases following scarlet fever, the disappearance time varied between sixty and ninety minutes; most of these occurred late in convalescence.

In a case of noma, the disappearance time on admittance was fifty-five minutes, and increased to seventy minutes as the condition of the mouth improved. The urine was normal.

In a case of peritonsillar abscess with a marked fever and urine loaded with albumin and casts of all kinds, there was little or no reduction in the disappearance time. This case, considered in conjunction with the others, seems to furnish additional justification for the division of kidney affections into "nephritis" and "nephrosis," the former involving principally the kidneys, the latter all of the body tissues.

The diphtheria cases can likewise be divided into three groups, on the basis of the amount of the reduction of the disappearance time and degree of toxicity when tested. There were twelve cases of the toxic type, having marked albuminuria with hyaline and granular casts in the first group, with disappearance times varying from two to twenty-five minutes; twelve milder cases in the second group with times from twenty-eight to fifty-eight minutes, and six cases in the third group, in which the test was made well into convalescence, with disappearance times of from sixty-five to ninety minutes. In the second and third groups the urines were normal as regards albumin, sugar and microscopic examination.

In Groups 1 and 2 the test was done during the acute stage of the disease.

In most of the neglected diphtheria cases there was an acute nephritis; in these the disappearance time ranged between two and nineteen minutes. In only one case was there observable edema, first of the eyelids and later of the lower extremities, which edema appeared at the end of the fifteenth day of illness; the disappearance time was then three minutes, as compared with nine minutes on admittance. Thirty days after admittance, the disappearance time was forty-five minutes; on the thirty-sixth day it fell to thirty minutes; three days later the nephritis, which had disappeared according to the urinary findings, again returned. On dismissal, after a late paralysis and eighty days from the onset of the disease, the disappearance time was fifty-two minutes.

COMMENT

In this study, the close relationship between the amount of reduction of the disappearance time and the severity of the intoxication of the patient was outstanding. The following observations indicate that the shortened disappearance time does not depend primarily on renal injury:

1. The frequent occurrence of a considerable reduction of the disappearance time with normal urinary findings.

2. The presence of pathologic urines only, as a rule, in cases presenting very marked reduction of the disappearance time.

3. The correct prediction, on the basis of a reduction of the disappearance time to twenty minutes, of the occurrence of pathologic urinary findings several days in advance in two cases.

4. The finding of much albumin and many casts, with little or no reduction of the disappearance time in one case.

CONCLUSIONS

From the study of seventy patients with scarlet fever and thirty patients with diphtheria, two thirds of whom were children, it appears that in these diseases:

1. The disappearance time of intradermally injected salt solution is reduced.

2. The reduction parallels the severity of the intoxication.

3. This test aids in indicating how the patient is getting along and in predicting the outlook for the near future.

TREATMENT OF LIME BURN OF THE EYE

OTTO BARKAN, M.D.
AND
HANS BARKAN, M.D.
SAN FRANCISCO

Of all the injuries to the eye, among the most disastrous in its result is a burn, especially one due to the action of a chemical irritant, such as quicklime. It may result in adhesions of the conjunctiva, in opacification of the cornea with marked reduction of vision, and even in loss of the eyeball.

The treatment that we here suggest has, as its main effect, the restoration of vision through clearing of the corneal opacity. Its further beneficial effects are marked alleviation of acute symptoms and shortening of the inflammatory period. In view of its principal action, the clearing of the corneal opacity, this discussion will be limited in the main to lime burns of the cornea.

Ramsay thus describes the process of lime burn:

> In the case of quicklime, the severity of the burn is due to the fact that the lime usually remains for a considerable period in contact with the tissues and its powerful escharotic action has time to take effect. The slightest particle of it entering the eye gives rise to the most intense irritation, leading to spasmodic closure of the eyelids and a copious secretion of tears, a combination of circumstances which is, as we have seen, most favorable in ordinary cases for the extrusion of a foreign body, but which is, in this case, most unfortunate because, by the firm closure of the eyelids, the lime is pressed against the eyeball, while tears slake any part of it which is as yet unslaked and the heat consequently evolved increases the work of destruction.

Burns with the most caustic form of lime, namely, quicklime, are comparatively rare, because it is less frequently handled than other forms and because when it is handled, this is done carefully and in full cognizance of its dangers. The burns most frequently encountered are caused by partially slaked lime, mortar or plaster. The admixture of sand in the latter is thought by some to add a further noxious agent to the lime, but it has been our experience that the sand acts rather as a diluent of the lime, and that such burns are less severe because less immediate, the gradual caustic action being protracted over a period of several days following the first contact. Immediate removal or chemical neutralization will therefore stop the burn long before it has attained

its full effect. The same reasons, namely, the lesser severity of the immediate burn, the protracted period of the caustic action, and the resulting opportunity of cutting it short by means of neutralization, have led us to give a much better prognosis to burns with various forms of partially slaked lime than has heretofore been possible. In such cases, a neutralizing solution has stopped further damage, which surely would have taken place even when the solution was applied as late as four days after the injury. One of our first questions, therefore, in more or less recent cases is as to the nature of the material handled, and how long before the injury it had been slaked.

According to the researches of Guillery,[1] Zur Nedden[2] and Fuchs,[3] the corneal capacity following lime burn is due to a chemical combination of the lime with the cornea, namely, to the formation of calcium albuminate and calcium carbonate. As the affinity of lime to albumin is very slight in comparison to its great affinity to carbonic acid, it is safe to assume that calcium carbonate forms the major part of the opacity. It also seems probable that the gradual increase of opacification in time is due to a further conversion of the albuminate to the carbonate by the carbonic acid of the tissues and of the air.

The opacity is then an incrustation consisting mainly of particles of calcium carbonate, a substance which unfortunately, is only little soluble. The slight temporary spontaneous clearing occasionally observed within a few days of the burn is thought to be due to a swelling of the cornea, the result of its mucoid material being dissolved by calcium hydroxid. According to some observers, slight spontaneous clearing occasionally occurs in time. The rule is, however, to the contrary.

TREATMENT

Treatment has, in the past, consisted of attempts at removal of gross particles by manipulation, and by a thorough douche with a stream of cold water at the site of injury. Solution of sucrose has been used on the theory that it will dissolve lime. In consideration of the slow solvent action, if any, that such a solution may have and the quick caustic action of the lime, this measure seems of little promise. Milk has been instilled, and olive oil and a large number of other therapeutic measures have been suggested, none of which seem to have more than a temporary palliative effect.

Until Guillery, in 1902, reported the use of ammonium chlorid solution for clearing calcium opacification of the cornea, this condition was regarded as incurable—as it is still generally regarded today. Zur Nedden, in 1905, confirmed Guillery's results by obtaining marked clearing of the cornea with ammonium chlorid in five out of seven cases. In only one of these cases, however, was there a definite improvement of vision, namely 1/10 to 5/10. By animal experimentation, he further showed that a solution of neutral ammonium tartrate is the most efficacious of the inorganic ammonium salts. The reason for this is that calcium tartrate, which is first formed, is very soluble in solutions of alkali tartrates and also of ammonium tartrate.

The solution must be neutral, for the slightest acidity (the commercial product usually is slightly acid) causes a marked burning sensation, and may spoil the desired result as well. Zur Nedden advises immersing the thoroughly cocainized eye in a 4 per cent. solution for from one-quarter to one-half hour twice daily, and, within a few days, increasing to 10 or 20 per cent., according to the sensibility of the patient. If the burning sensation interferes with the immersion of the eye, a drop of cocain may be instilled and the bath continued. In 1906, Zur Nedden was able to report a case of lime burn of the cornea which was cleared by means of his solution. Treatment was begun twelve days after the injury. After six weeks, vision had improved from the original 1/100 to 2/5.

Zur Nedden's and Guillery's cases are the only ones reported in the literature to date as cleared, even if only partially, by means of therapy. Only bare mention is made of this method in the standard textbooks of today, and, to the best of our knowledge, it is not being used either in this country or in Europe. We are therefore encouraged to publish the following case histories and remarks on the use of what we regard to be an invaluable remedy.

REPORT OF CASES

Case 1.—N. S., a man, aged 25, dropped a barrel containing a mixture of lime, sand and cement, May 12, 1922. The lime had been slaked with water three days previously. The day after the slaking, sand and cement had been added. Both eyes were injured by a wad of this material, which had the consistency of porridge. The eyes were immediately rinsed with a stream of water. Half an hour thereafter, the local physician washed them out with water and olive oil. When first seen by us, May 18 (six days after the injury), both corneas were so opaque that the pupil and the iris could barely be distinguished. The conjunctiva bulbi was necrotic in the palpebral fissure. The vision in each eye was restricted to hand movements at 1 foot. A few lime or cement particles were removed from the upper culdesac, and ice compresses were applied to allay pain. May 22, ten days after the accident, the left eye was washed with 10 per cent. neutral ammonium tartrate solution. The next day, the eye had definitely improved in general appearance; the surface of both conjunctiva and cornea was smoother, and there was less inflammation. During the instillation, and also on the following day, one was able to observe that around two discrete points of the conjunctiva bulbi, where minute particles of lime had been embedded and had escaped mechanical removal, a distinct focal chemical reaction was taking place. Treatment was instituted on the other eye, and was continued twice daily. June 29, vision of the right eye was 3/10; of the left, 5/10. At this time, the corneal microscope and slit lamp showed interesting changes in the cornea. The homogeneous superficial incrustation of the cornea showed cracks, which increased in length, arboresced and met until a cake of the crust dropped off, leaving behind a bit of transparent cornea through which the underlying iris could be distinctly seen. When such clear areas coalesced, a larger transparent area resulted, and, in this manner, the pupillary area of the cornea was cleared of incrustations. A very delicate opacity of the cornea remained, which appeared under the slit lamp to be connective tissue rather than incrustation. As progress was very slow, abrasion of the cornea was done on the right eye, August 21. August 28, the vision of the right eye had increased from 3/10 to 5/10. August 31, abrasion of the left cornea was done. September 12, the patient was dismissed with vision of the right eye, 6/10 partial and he could read Jaeger type 1 at 15 cm.; of the left, 6/10 partial and he could read Jaeger type 1. He could read newspaper print with comfort at 25 cm.

Case 2.—L. B., a plasterer, aged 68, whose left eye had been blind from retinal detachment since he was 15 years old, had plaster fall in the right (good) eye, Feb. 5, 1923. The eye was rinsed, and various treatments were applied by the local physician. When first seen by us six weeks afterward, there was a homogeneous incrustation of the cornea, which

1. Guillery: Ueber die Kalktrübung der Hornhaut und Verfahren zu ihrer Aufhellung, Arch. f. Augenh., February, 1902.
2. Zur Nedden: Ueber Aufhellung von Blei and Kalk Trübungen der Hornhaut, Tr. Heidelberg Congress, 1905, p. 216.
3. Fuchs, E.: Bericht über die 32te Versammlung der Ophthalmologischen Gesellschaft, Heidelberg, 1905, discussion, p. 225.

reduced vision to counting fingers at 3 feet. The patient stated that vision had certainly not improved, but rather had grown slightly worse since the injury. The corneal microscope showed the incrustation to be homogeneous and superficial, comparable to a thin sheet of frosting on a cake. Treatment was given periodically for two weeks at a time, and an abrasion of the cornea was done after four weeks. June 29, vision of the right eye was 2/10 partial. October 18, three months and a half after, vision of the right eye was 3/10 with correction, 4/10 partial, and he could read Jaeger type 4. December 14, ten months after the injury, the vision of the right eye was 5/10 partial and he could read Jaeger type 2. The patient returned to work.

CASE 3.—While P. G., a plasterer, aged 29, was plastering, Oct. 29, 1923, lime dropped into the right eye. He was treated elsewhere for two months. The patient stated that vision had improved considerably since the injury, but had remained stationary during the last three weeks. The vision of the right eye was 2/10; of the left eye, 10/10 partial. The opacity in this case was similar to the opacity in Cases 1 and 2. A peripheral zone of the cornea, however, about 2 mm. wide, was clear, and from this several cracks extended toward the center of the incrustation. Treatment induced typical microscopic changes but no improvement of vision. Abrasion of the cornea was therefore done, and a considerable part of the incrustation was removed. Feb. 14, 1924 (three and one-half months afterward), there remained only a very faint, nebular scar. The vision of the right eye was 10/10 partial, slightly blurred, and he could read Jaeger type 1; of the left eye, 10/10 partial, and Jaeger 1.

CASE 4.—J. M., a plasterer, aged 32, received a moderately severe lime burn of the right eye, Feb. 7, 1924, with some opacity of the cornea. The vision of the right eye was 1/10; of the left, 10/10. He was given daily treatments. February 12 (after five days), the vision of the right eye was 6/10. February 15 (after eight days), it was 10/10, and he could read Jaeger type 1.

We have also treated a large number of fresh, but less severe, lime burns with the same solution, and found in all of them marked alleviation of symptoms. In the opinion of some patients, who had sustained burns on previous occasions, the period of inflammation and discomfort was shortened by at least one half. In one case of marked burning sensation of the somewhat red and swollen skin of the eyelids, the burning sensation was instantly and permanently relieved by a moment's irrigation of the skin with the solution.

SUMMARY

In Cases 1 and 2, men who presumably would have remained practically blind for the rest of their lives attained vision of 6/10 and could read Jaeger type 1, and 5/10 and ability to read Jaeger type 2, respectively. In Case 3, vision of the single injured eye was improved from 2/10 to 10/10. In these cases, the improvement was due solely to the clearing solution and the operative measures employed. In Case 4, vision was improved from 1/10 to 10/10, but, as this patient was treated within an hour of the injury, one cannot tell how much of the improvement was due to the treatment alone.

Abrasion of the cornea was done with a keratome in the usual manner. It was followed by further improvement of vision in some cases. It is our impression that the previous use of the neutralizing solution permitted a more successful abrasion than would otherwise have been the case.

It is to be hoped that this method will accrue to the benefit of those unfortunates whose eyes have been burned with lime. It is worthy of note, in this connection, that the incrustations can still be cleared months and possibly years after the date of injury. The use of the corneal microscope and slit lamp is of great advantage in the proper treatment of these cases.

We feel constrained to warn against the promiscuous use of this very active solution by inexperienced hands. Needless to say, a certain amount of experience and individual judgment is necessary. (We have at present a patient under treatment for lime burn of the cornea in a previously glaucomatous eye; he was given atropin at an emergency station.) The necessity of cocainization and of using only a neutral freshly prepared solution of ammonium tartrate precludes its use as an emergency measure. Fortunately, the lapse of time between the injury and the application of the solution plays no great rôle, if any, in its clearing action. On the contrary, it appears to be harmful to apply the chemical reagent before every particle of lime has been first mechanically removed by the maneuvers of an experienced specialist.

The treatment of lime burn of the eye should, in our opinion, therefore consist in immediate rinsing out, lids apart, with a stream of cold water at the site of the injury; and the patient should then be dispatched post haste to a specialist. After removing every particle of lime still present, the specialist should use the method here described, according to the individual indications.

516 Sutter Street.

THE EARLY DIAGNOSIS OF JOINT TUBERCULOSIS *

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Late cases of tuberculosis of joints, in which destruction has taken place, offer comparatively little difficulty in diagnosis, although not a few of these, so-called, at operation prove to be some other pathologic condition. Early cases, however, by which is meant those in the first year or two of the disease, are exceedingly difficult to diagnose, and are the source of a high percentage of error. The experience in this clinic has led to the belief that in many of these cases a positive diagnosis cannot be made by the ordinary methods so far in general use. For this reason, it has become our routine to do exploratory operations in all doubtful cases. Not only are cases of tuberculosis commonly mistaken for some other condition, such as chronic arthritis or synovitis, but other conditions are considered as tuberculosis and treated as such. It is difficult to decide which error causes the greater harm.

This applies not only to the recent past, when such entities as Legg's disease were not known and when the employment of the roentgen-ray and various laboratory tests was not as general as now, but also to the present time. In a recent study of cases treated at the country branch of the New York Orthopedic Dispensary and Hospital during a twenty year period from 1901 to 1921, it was found that, of 141 cases of tuberculosis of the hip, twenty-three cases, or 16 per cent., in all probability were not tuberculosis. This conclusion was drawn after a review of the history and an examination of the roentgenogram and of the patient. Of seventy cases treated as tuberculosis of the knee joint, four have been found to be other than tuber-

* From the clinic of the New York Orthopedic Dispensary and Hospital.

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* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelop.

culosis, and seven others are very doubtful, although they have not been proved. It is believed that this state of affairs has not been peculiar to this institution, but is fairly representative of others in which this disease is treated.

In the sixty-three cases that form the basis of this paper, operations were performed between January, 1922, and March, 1924. In all of them, tuberculosis was suspected, and the operation gave an opportunity to prove the cause by histologic examination.[1] They fall into two groups. The first, twenty-five in number are comparatively early cases in which tuberculosis was suspected but could not be proved. An exploratory operation was done in each. In the second group were cases of longer duration, in which joint destruction was so far advanced as to preclude the possibility of recovery of function. While tuberculosis was suspected as the etiologic factor, it was felt that whether or not this was so an arthrodesis was indicated. In these cases, then, operation was undertaken primarily as a therapeutic rather than as a diagnostic measure. There were thirty-eight cases in this group.

Of the thirty-nine cases of proved joint tuberculosis, an incorrect diagnosis was made in fourteen on admission to the dispensary. In most of them, this soon was changed to tuberculosis. The diagnoses were: chronic synovitis, five; chronic arthritis, five; gonorrheal arthritis, one; acute arthritis, two, and osteomyelitis, one. Three cases were regarded as suggestive. The errors in diagnosis in these cases before they were admitted to this hospital were much greater in number, scarcely any of them having been considered tuberculosis.

Usually, the diagnosis of tuberculosis of a joint is first made late in the course of the disease. Frequently, only after the condition has been present for several years is the true cause suspected. This is so because the process is slow and insidious and the classic signs, as taught in many of the textbooks, are late developments. It can be accounted for also by the fact that an erroneous idea of the pathology of this condition is prevalent, as will be pointed out in another paper.

The average duration before admission to this clinic in the thirty-nine proved cases under consideration was thirty-two months, estimated from the history. Because the observation and memory of the patients often are inaccurate, however, it is possible that the period was even longer. The shortest period was two weeks, and the longest twelve years. As accurately as could be determined, the average time after onset before tuberculosis was suspected was thirty-two months. The majority were not correctly diagnosed before admission. The average duration before the diagnosis was proved was five years, the shortest period being three months and the longest thirty-three years. It must be remembered also that the average is lower than usual in this group because a number were subjected to exploratory operation early.

A frequent cause of obscurity in doubtful cases is the use of plaster or apparatus before a sure diagnosis can be made. This leads to further decalcification of bone and atrophy of muscle together with limitation of motion, which soon make it impossible clinically to tell whether or not tuberculosis is present. Such treatment should not be started until one is certain of the condition. A child who had been under treatment for tuberculosis of the knee at the country branch of this hospital for four years was subjected to exploratory operation at which no evidence of tuberculosis was found, although there was a pathologic condition, probably an arthritis. Another child was found to have a nontuberculous condition after she had been treated with a brace for eight months. Such treatment results not only in the child's being withdrawn from normal activities, but also may cause permanent damage to the joint. It now is our custom in all doubtful cases to confine the patient to bed without immobilization, for careful study. If the diagnosis still is uncertain and sufficient time has elapsed for an evanescent arthritis to clear up, an exploratory operation is done.

The effect of these frequent errors in diagnosis is threefold: (1) Many cases of tuberculosis are allowed to go for years with improper treatment or no treatment, thus giving the disease an opportunity to destroy the joint and endanger the life of the patient; (2) cases that are not tuberculosis are subjected to years of unnecessary treatment, and (3) the statistics as to the results of various forms of conservative treatment are inaccurate and unreliable. Many of the cases reported as cures probably were not tuberculosis at all.

While none of the laboratory tests done in these cases are new, it is felt that some purpose may be served in presenting a summary of results in a series of cases proved beyond doubt to be tuberculosis, a value that few such statistics have.

PIRQUET TEST

The Pirquet test was done in fifty-eight of the sixty-three cases studied. A positive result was obtained in all of the thirty-six proved cases in which it was tried, although in one the first test was negative and a subsequent one positive, and in another case a negative reaction was found after the first test had been positive. The latter patient was greatly debilitated by an active bilateral hip joint involvement. A child with tuberculosis of the spine not included in this group, gave a negative reaction before operation for spine fusion, and a positive reaction after operation when the general condition had improved greatly. The test was used in twenty-one of the twenty-four cases in which no evidence of tuberculosis was found at operation. It was positive in fourteen; doubtful in one, and negative in seven. One case gave a negative reaction after having had a positive one.

Of course, a positive Pirquet reaction simply means that at some time the individual has been infected with tuberculosis, and gives no indication whether the lesion with which we are dealing is tuberculosis. Charles Hendee Smith [2] states that he has no patience with the view that the Pirquet reaction is of no value after the age of 2 or 4. He says that the factors of error are an overwhelming tuberculous infection or an acute illness, both of which may prevent or suppress the reaction, and errors in technic. Smith finds from his experience in the children's service at Bellevue Hospital that the intradermal, or Mantoux test, is twice as accurate as the epidermal, or Pirquet test. I have had no experience with the former.

The use of bovine as well as human tuberculin is worth considering. Lippmann [3] reports a series of 300 children on whom the test was done with both kinds (Table 1). The results are given in Table 1.

Both human and bovine tuberculin were used in twenty-one cases of the present group. The results were: human and bovine positive, sixteen cases; human

1. In one case in which operation was not performed, the condition was proved by guinea-pig inoculation.

2. Smith, C. H.: Bull. New York Tuberc. A. 4, March-April, 1923.
3. Lippmann, A.: Deutsch. med. Wchnschr. 47: 1390, 1921.

positive, bovine negative, one case; human positive, bovine doubtful, one case; human negative, bovine positive, two cases, and human and bovine negative, one case.

It was found in a series of 117 cases of joint tuberculosis, thirteen of which were proved and 104 suspected, which includes the foregoing group, that the reaction to the human tuberculin was positive and to the bovine tuberculin negative in three; to the human negative, and to the bovine positive in twelve. Twenty-four cases gave a stronger reaction to bovine than to human, while in none was the reverse so. It is now the routine practice in this clinic to use both kinds of tuberculin.

TABLE 1.—*Results with Human and Bovine Tuberculin in Three Hundred Tests in Children*

	Per Cent.
Human and bovine positive	50
Human positive, bovine negative	24
Human negative, bovine positive	5
Human and bovine negative	21
Total	100
Human stronger	16
Bovine stronger	4.5

SUBCUTANEOUS TUBERCULIN TEST

The subcutaneous tuberculin test was done in twenty-three cases, twelve of which were proved tuberculous by histologic examination. Of the remaining eleven, ten probably were not cases of tuberculosis; but the diagnosis was not proved in four because the tissue sent to the laboratory was insufficient. Before the tuberculin was injected, the patients were kept in bed and the temperature was taken every two hours. Koch's old tuberculin was used. A rise in temperature of 1 degree or more was considered a positive general reaction, and an increase in swelling, heat, muscle spasm and pain was interpreted as a positive focal reaction. If the test was repeated with a larger amount, at least two days was allowed to elapse. The results in the twelve proved cases were: positive, six; doubtful, three, and no reaction, three. In the second group of eleven cases, ten of which almost certainly were not tuberculosis, the results were: positive, three; doubtful, five, and no reaction, three. In a case not in this series, which later proved to be sarcoma of the lower end of the femur, a rise in temperature with increase in pain in the knee resulted from an injection of tuberculin. It seems evident from these tests that a positive general and focal reaction can be obtained in cases of chronic arthritis and other nontuberculous conditions if the dosage is sufficiently high, and that with a small amount of tuberculin no reaction may be obtained in a case of tuberculosis—in short, that the test is of very little if any value. The results are summarized in Table 2.

BLOOD COUNT

The leukocyte count in the proved cases varied between 4,400 and 13,600, with an average of 7,000 or 8,000. In general, the lymphocyte percentage was high, but in many the differential was normal. In eight cases who had a fairly severe post operative reaction, which alone ordinarily would be expected to cause a leukocytosis with polymorphonuclear increase, the white cell count and polymorphonuclear percentage fell at this time, but in eight others there was a moderate rise. There was not, however, the degree of leukocytosis that would be expected as a result of operative procedure.

GUINEA-PIG INOCULATION

Guinea-pig inoculation was resorted to in twenty-four cases. In several of these, fluid was aspirated from the joint before operation, and in the remainder either fluid or tissue obtained at operation was used. Of the twenty-four cases, eighteen were proved by operation to be tuberculosis, and the other six were not tuberculosis. In the former group there were ten positive results and four negative. Two pigs died at the end of two weeks, and at that time had no tuberculous lesions. Two others were lost. This is the only laboratory test that proves the diagnosis, but when the result is negative the question still is undecided. The procedure should be used in all suspected cases in which it is possible to obtain fluid, and should be used as an addition to tissue examination in cases in which exploratory operations are done. It has the disadvantage of requiring six weeks for a result, and of being inconclusive when negative.

WASSERMANN TEST

The Wassermann test is done as routine in all cases suspected of being tuberculosis of the joints. By error, it was omitted in four of these sixty-three cases. There were two positive results, both four plus. One of these patients had a tuberculous knee, and the other had a chronic synovitis which was not tuberculous and probably was syphilitic. A positive Wassermann test does not preclude the possibility of tuberculosis. On the other hand, several doubtful cases not included in this group improved with antisyphilitic treatment, and it is quite probable that not a few persons with syphilitic joints fail to give a positive reaction.

TABLE 2.—*Results with Subcutaneous Tuberculin in Twenty-Three Cases, Twelve of Which Were Proved Tuberculous by Histologic Examination*

Case	Histologic Diagnosis	Age	Amount, Mg.	Reaction: General	Reaction: Focal
	Group 1				
7	Tuberculosis of knee	42	0.3	+	0
			0.4	+	+
13	Tuberculosis of knee	9	0.1	+	0
			0.3	+	+
18	Tuberculosis of knee	11½	0.1	+	?
22	Tuberculosis of knee	32	0.4	+	+
			0.6	+	+
23	Tuberculosis of knee	28	0.3	0	0
25	Tuberculosis of ankle	14	0.15	0	0
29	Tuberculosis of knee	9	0.15	+	+
30	Tuberculosis of knee	8	0.01	0	0
			0.1	0	0
32	Tuberculosis of knee	12	0.2	+	+
34	Tuberculosis of hip	5	?	+	+
36	Tuberculosis of knee	5	0.1	+	0
			0.2	+	0
40	Tuberculosis of knee	7	0.15	+	?
	Group 2				
42	Chronic arthritis of knee	44	0.2	0	0
			1.0	0	0
			3.0	+	+
43	Chronic arthritis of knee	42	0.1	0	0
			0.5	0	0
			5.0	+	+
44	Chronic arthritis of knee	4¾	0.1	0	0
46	Chronic arthritis of knee	6	0.1	0	0
			0.2	0	0
47	Chronic arthritis of knee	6½	0.1	0	0
			0.2	+	0
49	Syphilis of knee	15	0.2	+	?
50	Chronic arthritis	28	0.4	+	+
51	Chronic arthritis (?)	10½	0.3	+	?
56	Chronic arthritis (?)	15½	0.2	0	0
61	Chronic arthritis (?)	6¾	0.05	0	0
			0.1	+	0
62	Tuberculosis of ankle (?)	11½	0.1	+	?

ROENTGEN-RAY EXAMINATION

The roentgen-ray examination was considered consistent with tuberculosis in thirty-six of thirty-eight proved cases, and to indicate a condition other than tuberculosis in two. Of the thirty-six, however, the

evidence was doubtful in twenty-two. The earliest cases showed simply an effusion and thickening of the synovia. A little later, a local decalcification with a narrow area of increased subcortical decalcification was seen. Decrease in the width of the joint space was a fairly early sign. Evidence of bone destruction was present in very few of the early cases. A very frequent finding early in the disease in the knee joints, on the contrary, was relative increase in the size of the tibial and femoral epiphyses as well as of the patella. This corresponds with the clinical observation that increase in length of the extremity is apt to occur in these cases. This overgrowth was found, however, in two patients who had received immobilization treatment for tuberculosis, and who subsequently were proved not to have tuberculosis.

Of all the laboratory tests, then, a positive guinea-pig inoculation is the only one that proves the diagnosis; and here a negative test does not exclude the possibility.

EXPLORATORY OPERATION

In many cases, exploratory operation offers the only means of making a positive diagnosis, and there should be no hesitation in resorting to it. It is justified by the extreme importance of being absolutely sure of the condition before beginning treatment, no matter what that treatment may be. The idea that it is safer to treat the case conservatively at first and to await developments is a fallacious one, because once immobilization is started the condition is obscured indefinitely. Exploration of a joint is a simple and safe procedure, which causes no permanent and very little temporary disability. The tradition that it is dangerous to open the knee or any other joint surely no longer is held by the modern surgeon.

Twenty-five patients among the sixty-three here reported were operated on by four surgeons for the purpose of making a diagnosis. The wound healed in each case by primary union; the reaction was slight, and, in those cases in which no evidence of tuberculosis was found, the recovery of function was rapid. In the knee cases, flexion to 90 degrees at the end of two weeks was usual. The operative procedure, in fact, is not as severe as that for the removal of a semilunar cartilage.

In eighteen cases, the knee joint was involved; in four, the hip (one bilateral); in two, the tarsus, and in one, the ankle. Tuberculosis was found in eighteen cases, and in seven it was not found. The average duration of symptoms before operation was one and one-half years. The age of the patients varied from 4 to 50 years.

The pathologic condition of these patients will be described more in detail in another paper. It suffices to say that the gross appearance was typical in the majority, and that usually the operator had little difficulty in deciding whether or not the condition was tuberculosis. In the eighteen positive cases, a diagnosis of tuberculosis was made in sixteen at operation. There was some doubt about one, and in the other—a bilateral hip joint affection with dislocation and huge abscesses—the presence of tuberculosis was not suspected during the operation. The other seven cases were chronic arthritis, one of them undoubtedly syphilitic. In five of these, the operators decided that the lesion probably was not tuberculous, but in two the surgeon was positive that it was so. In these two cases, however, well prepared and apparently representative sections of the tissue showed no evidence of tuberculosis. It seems fair to conclude that in early cases the gross appearance of the joint at operation should not be relied on, but that the diagnosis should await examination of sections of the tissue.

It is of the greatest importance to send to the laboratory a number of pieces of well selected tissue from several parts of the joint. Although this was done in all these cases, in thirteen of the older ones—all of them in an advanced stage of destruction indicating arthrodesis—the tissue received at the laboratory was insufficient for diagnosis. The majority of these were undoubtedly tuberculous. In five of seven cases in which a special search was made in sections stained with carbolfuchsin, acid-fast bacilli were found in the tissue. In one case, an attempt was made to clinch the diagnosis at operation by means of frozen sections. This was unsuccessful, but typical tubercles were found in the permanent sections. It is now the routine to inoculate a guinea-pig with either fluid or tissue taken from the joint at operation.

CONCLUSIONS

1. In the first two years of the disease, it always is difficult to make a positive diagnosis of tuberculosis of a joint.
2. The only laboratory test that establishes the diagnosis is guinea-pig inoculation, and this is inconclusive when negative.
3. The condition is obscured in many cases by immobilization before the diagnosis has been proved.
4. The percentage of error in diagnosis of these conditions is high. The mistake of calling a nontuberculous condition tuberculosis probably is just as frequent as the reverse.
5. As a result of the large factor of error in diagnosis, much harm is done to the patients, and the statistics about the results of conservative treatment are misleading.
6. Because of the extreme importance of being certain of the diagnosis, exploratory operation is indicated in all doubtful cases.

REPORT OF CASES

CASE 3.—H. L., a colored man, aged 28, admitted, Aug. 27, 1923, with a diagnosis of tuberculosis of the right knee, had trouble in the right knee for three years, beginning with stiffness and pain. It was treated in a tuberculosis hospital for twenty-five months with a plaster cast. The surgeons then decided that he did not have tuberculosis, and treated him for arthritis with injections of foreign protein. The right knee was 1 inch larger in circumference than the left, and the tissues were thickened. The extension was to 180 degrees, and the flexion from 15 to 20 degrees, limited by muscle spasm. Roentgen-ray examination, the day of admission, showed thinning of the joint space, irregularity of the femur and patella, decalcification of all bones and thickening of all soft parts. This condition was consistent with tuberculosis. The Pirquet reaction to human tuberculin was positive. The Wassermann reaction was negative. White blood cells were 5,200; polymorphonuclears, 64 per cent. The tuberculin test, with 0.3 mg., caused no rise in temperature or local reaction. An exploratory operation performed, October 31, revealed a gross appearance that seemed typical of tuberculosis. One cubic centimeter of yellow fluid from the joint was injected into a guinea-pig; necropsy six weeks later showed tuberculosis. The tissue report was tuberculosis. The wound healed by primary union.

CASE 5.—J. B., a girl, aged 14 years, admitted, Sept. 15, 1923, with a first diagnosis of arthritis of the left ankle, complained that the ankle had been swollen and painful since a sprain one year before. There was markedly indurated swelling about the lateral malleolus. There was no bone tenderness. The motion was limited by spasm. Dorsiflexion was 90

degrees. She had a slight limp. Roentgen-ray examination, September 15, showed effusion of the left ankle; no decalcification or thinning of joint space. The Pirquet reaction to both human and bovine tuberculin was positive. The Wassermann reaction was negative. The gonnorheal complement fixation was negative. White blood cells were 9,200; polymorphonuclears, 58 per cent. The ankle was strapped and treated as arthritis. By November, there was no improvement. Muscle spasm and limitation of motion became more pronounced. Roentgen-ray examination, November 3, showed effusion still present. The joint space was thin; there was no decalcification. An infectious arthritis, probably syphilitic, possibly tuberculous, was indicated. December 5, the tuberculin test with 0.15 mg. was given with no reaction, general or focal. An exploratory operation, December 11, revealed that the appearance of the joint was typical of tuberculosis. The fluid was injected into a guinea-pig; the guinea-pig died in two weeks with no evidence of tuberculosis. The tissue report was tuberculosis. Acid-fast bacilli were found in the tissue. The wound healed by primary union.

CASE 8.—R. F., a girl, aged 6 years, admitted, Jan. 5, 1922, with a first diagnosis of chronic synovitis of the left knee, about two weeks before admission had an "abscess" on the outer side of the left knee. The joint had been painful and swollen. The left knee was 1½ inches larger in circumference than the right, and the patella floated. Motion was limited in all directions. There was a small sinus on the outer side from which a drop of pus could be expressed. Plaster was applied. Roentgen-ray examination, the day of admission, showed marked swelling about the left knee; the joint space slightly thinned; marked distention of the capsule by exudate; no decalcification, and no definite evidence of tuberculosis. A brace was applied, and worn intermittently with a period of improvement. The Wassermann reaction was negative. White blood cells were 10,400; polymorphonuclears, 45 per cent. Roentgen-ray examination, Jan. 9, 1923, showed no noteworthy change, but continued absence of productive reaction increased the probability of the fundamental lesion being tuberculosis. Exploratory operation, February 26, revealed an appearance typical of tuberculosis. The tissue report stated that there were fairly definite miliary tubercles, although no giant cells were seen. Tissue from the joint was implanted in a guinea-pig, with a positive result. The wound healed by primary union.

CASE 19.—I. L., a woman, aged 44, admitted, Aug. 22, 1923, with a diagnosis of tuberculosis of the left knee, had a gradual onset of pain in the left knee in December, 1922, which recurred intermittently through the winter. She injured the knee in a fall in May, 1923. Two weeks later, it began to swell and became stiff and painful. Symptoms had been continuous and progressive since. Five weeks before admission, a cast was applied for ten days. It completely relieved the pain, which returned after its removal. The patient appeared worn and fatigued. The left knee was flexed at 160 degrees. There was painful motion of 10 degrees, with muscle spasm. The knee was swollen. There was atrophy of the thigh and calf. Roentgen-ray examination, the day of admission, showed a moderate, dense, well defined effusion of plastic type; thinning of the joint space, but no definite bone involvement. The appearance was consistent with tuberculosis. White blood cells were 8,100; polymorphonuclears, 74 per cent. The Wassermann reaction was negative. The Pirquet reaction to human tuberculin was negative. The tuberculin test, with 0.2 mg., caused a temperature rise of 0.6 degree. There was no focal reaction. Following two succeeding injections of 1 mg., there was no general or focal reaction. After 3 mg., there was a temperature rise to 101.6 F., with headache and distinct increase in pain in the knee. Exploratory operation, September 12, revealed the synovia and fat pads to be infiltrated and edematous, and in places there were numerous small white nodules, apparently miliary tubercles. The operator considered the condition undoubtedly tuberculosis. The tissue report stated that there was very cellular granulation tissue closely packed with lymphocytes and plasma cells. There was some perivascular edema and infiltration. The diagnosis was chronic synovitis. There was evidence of tuberculosis. The wound healed by primary union.

ABSTRACT OF DISCUSSION

DR. EDWARD J. LEWIS, Chicago: How many cases of knee-joint infection were proved to be tuberculous after puncture of the joint and the injection of the fluid into a guinea-pig was negative? I wish that Dr. Smith would describe his technic exactly, where he makes the incision and how much tissue he removes, and whether it is necessary to remove considerable of the synovia in order to find this.

DR. ALAN DE F. SMITH, New York: My technic has been to make a fairly long incision to the inner side of the patella. We have not gone to the extent of making a midpatellar incision. That has afforded us an opportunity to take a good look at the joint. We take out several small pieces of tissue in order to get a good picture of the pathologic changes in various parts of the joint. This, however, does not amount to a synovectomy. I think we have the figures about the guinea-pig test in my paper, although I did not read them. The guinea-pig inoculation was resorted to in twenty-four cases. Two pigs were lost and two died at the end of two weeks. This left fourteen tests in proved cases. Ten of these were positive and four negative. One has about that chance of getting a positive result in a case that is tuberculous.

SECONDARY CLOSURE OF TUBERCULOUS NEPHRECTOMY WOUNDS*

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The secondary suture of wounds assumed great prominence during the war, and in the literature between 1914 and 1919, one finds many articles devoted to this subject. In civil practice this procedure is rarely necessary, as most surgical wounds are closed by primary suture, and in infected wounds, drainage is so instituted that secondary suture is seldom necessary. One exception to this, however, is in those cases of tuberculous nephrectomy wounds which break down completely in spite of every preventive precaution.

That this not an uncommon complication is shown by the fact that in eighty-nine cases of nephrectomy for renal tuberculosis studied in this series, in sixteen cases there was complete dissolution of the wound following operation.

The first consideration of interest is the underlying cause of the failure to heal, and to this end these cases have been analyzed and compared with the cases in which the wound healed by primary union. The average age of these sixteen patients is 40 years, the youngest being 21 and the oldest 48. This differs in no respect from the general average age of patients with renal tuberculosis, as this disease is commonest between 20 and 40. The duration of symptoms of these cases before operation has been two years, while the total average in the eighty-nine cases is three years. This may be of some significance, as the infection after three years may have become less acute than at the end of two years. It is interesting to note that in these sixteen cases only two presented symptoms more than two years. One of these gave a history of symptoms for ten years, and the other for five years. In five cases, 33 per cent., the onset of symptoms was less than one year before admission to the hospital.

Cystoscopic examination showed ulcers in the bladder in six of these sixteen cases, or 37 per cent., while in the eighty-nine cases there was ulceration in twenty-four cases, or 27 per cent. Tubercle bacilli were found

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in sixty of the eighty-nine cases, or 77 per cent., and in fifteen of the sixteen cases in which there was breaking down of the wound. Examination of the histories reveals no evidence to indicate that the actual number of tubercle bacilli found in the urine is of any prognostic value so far as the severity and acuteness of the renal infection is concerned. One would expect this, because the number of bacilli in the urine represents those originating in a focus that drains into the tubules or renal pelvis. Thus, a small ulcerated lesion in the pelvis or at the tip of a papilla would eject more tubercle bacilli into the urine than a large abscess or cavity in either pole not directly communicating with the pelvis. Therefore, the abundance of bacilli found is no criterion of the extent of the kidney lesion. Since this is true, and because ulceration of the bladder in tuberculosis is directly proportional to the amount of infection descending from the kidney, it follows that the amount of vesical involvement in any case is no indication of the extent of the renal lesion.

Separate kidney function, as determined by the phenolsulphonephthalein and comparative urea determinations, gives no clue as to the acuteness of the renal lesion, as these are measurements of the amount of kidney tissue that is nonfunctioning, and there would be greater diminution of function in a chronic fibrous or caseous tuberculosis that had destroyed a large amount of kidney substance than there would be in a kidney with a small abscess, or in a tuberculous pyelitis. Therefore, one is unable to prognosticate the acuteness of the kidney lesion on the basis of the usual preoperative procedures used in arriving at a diagnosis.

The operative technic in all the eighty-nine cases has been essentially the same. The usual lumbar incision was made and extraperitoneal exposure of the kidney obtained. The pedicle was then ligated or transfixed and divided, and the kidney removed. The stump of the ureter has been treated in various ways, as will be discussed below.

For suture material, No. 3 chromic catgut has been used for the muscles and fascia, the only variation being the type of stitch employed. For the most part, interrupted sutures, either single or mattress or figure-of-eight, have been placed. In some, a single continuous suture has been placed in such a fashion that the muscles are approximated in two layers. This is obtained by starting the suture at the posterior angle and running it anteriorly, catching the lumbar fascia and transversalis in the first layer. The same suture is then continued posteriorly, the cut ends of the internal and external oblique muscles being sewed. It is unlikely that the type of stitch used could have a great influence in the healing of the wound, because, in the cases that have broken down, the separation has occurred only after two or three weeks in all cases, which would indicate that as long as the suture holds, the wound edges stay approximated; but after the suture material weakens, if there has been no coalescence of the edges of the wound, separation results. Both interrupted and continuous sutures will hold for this length of time, and if the healing process has not taken place at the end of two or three weeks, it is unlikely that a difference of a few days, which there might be in the length of time an interrupted or a continuous suture would hold, could materially affect the ultimate result.

It is obvious that the underlying cause of the failure of the wound to heal is infection. That this may occur in the fatty capsule before operation is indicated by the frequency with which marked adhesions are found surrounding the kidney. However, tubercles or caseation in the perirenal fat, and tuberculous perinephritic abscesses, are very rare, which would indicate that if there is any infection, it is usually mild. However, on this assumption it has been advocated that the perirenal fat be removed at operation. This was done in none of the eighty-nine cases studied, and therefore it is impossible to judge the efficacy of it.

Infection of the wound with the tubercle bacillus may be caused by the operator inadvertently spilling tuberculous material during the removal of the kidney, or, as is commonly held, it is due to contamination from the stump of the ureter. The latter is probably the most universal conception, and many procedures have been practiced to avoid this, such as division with a cautery to sterilize the cut ends, phenol (carbolic acid) injections into the lumen, ureterectomy, suture of the stump inside a tube which is brought to the surface, and suture of the cut end into the muscles at the lower angle of the wound. In the sixteen cases referred to here, the following methods were employed: phenolization of the cut end, five cases; phenol injection of the lumen of the ureter, four cases; simple ligature and division, three cases; accidentally broken off, one case; Paquelin cautery division, one case; the ureter was brought up into a tube in one case; ureterectomy in one case. It will be seen, therefore, that failure to heal has occurred in cases in which the ureter has been treated in divers ways, which suggests very strongly that the treatment of the stump of the ureter is not the predominating factor concerned in the breaking down of the wound, although it cannot be said that it has no influence.

There is, however, one factor which is constant and which apparently has a very definite influence on the subsequent behavior of the wound. This is the type of lesion in the kidney. Tuberculosis of the kidney may be considered as divided into acute and chronic types of infection. In the former may be placed acute tuberculous nephritis and pyelonephritis, tuberculous abscess, single and multiple, and, if there is ureteral obstruction, tuberculous pyonephrosis. In the more chronic types of infection, one most often sees solitary and miliary tubercles, caseation, cavitation and chronic fibrous tuberculosis. So far as the treatment is concerned, the division of renal tuberculosis into pathologic types is only of academic interest, because in all types nephrectomy is indicated; but it can be said with assurrance that the healing of the wound is closely related to the pathologic anatomy, and, in the acute types of infection, the wound is much more liable to dissolution. This has been recognized for some time, and it has been deemed wise by some to advise patients in whose urine multitudes of bacilli and extensively ulcerated bladders have been found to defer the nephrectomy until these symptoms should improve. This is, however, fallacious, because, as shown above, these are not accurate indexes of the acuteness of the kidney infection.

In the sixteen cases under consideration, eight presented multiple abscesses, three were pyonephrosis, three showed cavitation, and in the operative note it was said that some necrotic material accidentally was spilled into the wound. One case showed acute tuberculous nephritis, and in one case there was the cavernous type of kidney with no note as to whether or not any material was spilled at operation.

In the entire group of eighty-nine cases, every one in which there was a pyonephrosis has broken down

completely; and, if one considers the kidneys containing multiple abscesses as representing an early stage of pyonephrosis, these two types form eleven of the sixteen cases, or 68 per cent., of those which have failed to heal. Therefore, while it cannot be held that the wounds in all the pathologic types break down, it can be said that of all the cases which break down, these form a considerable part. Likewise, it is significant that none of the more chronic types of pathologic kidneys, when removed, have been followed by failure of the operative wound to heal.

The postoperative course of these cases is very similar. For the first week after operation, the wound appears healthy, and apparently is healing by primary union. After a fortnight or two weeks, one first notices slight induration and redness around the skin edges, which by this time are apparently healed. This induration increases until it surrounds the entire wound edges and is about 2 cm. wide on both sides of the wound. Then one sees developing along the line of incision several small areas of softening, usually beginning as very small spots a few millimeters long, and gradually extending along the line of incision until they are 1.5 or 2 cm. long, and are covered by an unhealthy, bluish film of skin. The most frequent sites are at the anterior angle and at the middle of the wound. If these are not opened, they will rupture in a few days and discharge thin, brownish, seropurulent material; and, after rupture, multiple sinuses develop along the wound edge, which increase in size until they unite and the entire wound is laid bare.

The depth to which this separation occurs varies. In four cases, not included in the sixteen under consideration, the nonunion has been confined to the skin and subcutaneous tissues, the muscle layers healing. Two of these cases were successfully followed. The wound in one case healed in two years, and in the other healing was complete after eighteen months.

In the sixteen cases that are studied here, there has been disunion of both the muscles and skin, occurring usually in the second or third week after operation in the manner described above. After separation of the wound edges, and destruction of the fatty capsule by the infection, there results a large granulating cavity, about 10 to 15 cm. in depth, from 8 to 10 cm. wide, and from 25 to 30 cm. long, which is lined by unhealthy, tuberculous granulation tissue. The orifice of the cavity is bounded by the retracted cut ends of the oblique muscles, and any possibility of approximation of these is precluded by their attachment to the ribs above and the crest of the ilium below, both of which are fixed points. It is therefore readily comprehensible why these wounds take several years to heal, since there is no tendency for the wound edges to fall together, as is usual in wounds of the soft parts.

The treatment of these wounds falls logically into two categories: (1) antiseptic, to combat infection; and (2) stimulative, to promote the growth of granulation tissue. The antiseptics that have been used are surgical solution of chlorinated soda (Dakin's solution), mercurochrome-220 soluble, meroxyl, potassium permanganate, hydrogen peroxid, gentian violet, acriflavine, phenol, silver nitrate and balsam of Peru. In each of the cases many of these have been tried and the results, so far as keeping the surface of the wound clean is concerned, have been good. It is not difficult to keep the cavity almost sterile with any of these drugs, but it is not the pyogenic infection that prevents healing, because in nontuberculous wounds granulations grow rapidly under treatment with these antiseptics.

The failure of tuberculous cavities such as these to heal has long been recognized to be due to the fact that, as the granulation tissue grows, tubercles develop in it, and there is a generalized lymphocytic infiltration with endarteritis. This diminishes the blood supply, so that the more superficial granulations tend to slough, resulting in extreme slowness in the obliteration of the cavity. Therefore, many methods have been employed to stimulate the granulations, but none with any great success in hastening closure. Radium was used in one case without apparent effect, as the wound was still open when the patient was last heard from, nine months after operation. Ultraviolet rays from the Kromayer lamp were used in four cases. In two of these the patients were not heard from after discharge, but the wounds were still open four months after operation, when the patients left the hospital. Hypotonic salt solution was tried in one case, and Beck's paste in one. None of these procedures had any noticeable accelerating influence on the growth of the granulation tissue. In two cases, the cavity was thoroughly curetted several months after operation, and in each case, closure occurred within six months, while in the remaining cases that it has been possible to follow, none have closed within this time. It has been possible to follow seven cases, and an approximate estimate of the time that elapsed before the wounds closed spontaneously can be obtained from these. One case closed, except for two sinuses, in seven months. In two cases, the wound was still unhealed when the patient was last heard from, nine months after operation; one case, after ten months; in three cases, at the end of one year. The remaining cases were not successfully followed.

It is obvious that these patients will be completely incapacitated in the presence of a large gaping wound such as occurs in these cases, and that this incapacitation is months, sometimes years, in duration. Therefore, any procedure that will restore them to activity without endangering their lives is of great value.

With this object in view, the last two cases have been closed by secondary suture, with most gratifying results.

REPORT OF CASES

CASE 1.—A man, aged 30, who entered the hospital, June 20, 1923, complaining of frequency of urination, had had no urologic disease, and with the exception of the usual diseases of childhood, the systems of the body had been entirely normal. The onset of the symptoms dated back six months before admission, beginning with burning, nycturia and frequency. These had gradually increased until the patient, when admitted, voided about every half hour during the day and night, with considerable burning and urgency.

General physical examination showed no evidence of tuberculosis in any part of the body, other than that found on urologic examination. Urologic examination revealed no involvement of the genital tract. The urine voided was cloudy in three glasses and contained much pus, but no acid-fast bacilli were found in the first examination. Cystoscopic examination revealed a bladder capacity of 100 c.c. The bladder mucosa was congested everywhere, and cystoscopy was painful. There were several irregular, typical, tuberculous ulcers in the base of the bladder, particularly on the trigon in the region of the left ureteral orifice. The ureters were catheterized and specimens taken for examination. Comparative urea determinations on each side showed the right side was 0.056 and the left side 0.044 gm. per liter. Bacteriologic examination of the separated urines showed the right side to be sterile after twenty-four hours. The

left side showed streptococci and acid-fast bacilli in the smear.

The patient was operated on, July 6, a left nephrectomy being done through the usual lumbar route. The ureter was sutured inside a rubber tube, which was brought out of the posterior angle of the wound. Two cigaret drains were inserted, and the muscles closed with interrupted figure-of-eight No. 3 chromic catgut.

The kidney removed was greatly enlarged, and scattered over the surface were many small tubercles varying in size from 2 to 1 cm. in diameter. On palpation, it was soft and fluctuant. On section, the medulla had been completely destroyed, and there was a pyonephrosis with about 200 c.c. of tuberculous pus in the cavity. The operative note mentions the fact that a small amount of pus escaped into the wound which, however, was washed out with meroxyl and salt solution.

Following the operation, the patient had an uneventful convalescence, and the daily postoperative notes described the wound as being healthy and healing nicely until July 28, three weeks after operation. It is interesting to note that, following operation, a large amount of urine was drained through the wound owing to regurgitation into the left ureter. This was first noticed, July 22, sixteen days after the operation, and probably followed sloughing of the ligated end of the ureter. It continued until August 27, at which time it ceased. July 28, the first indication of separation of the wound edges was evident, and the wound was vigorously treated with mercurochrome-220 soluble and gentian violet, and the edges were strapped to prevent dissolution. Also, the patient was treated with the Kromayer light. The wound slowly broke down and by August 8 the edges had completely separated. During August, the patient received general hygienic treatment with antiseptics applied to the wound to keep it clean, and under this treatment gradually improved in health. This continued through September, with no particular change in the appearance of the wound. Although it was quite clean, it failed to granulate because, as the granulations grew they sloughed, and it was evident that many months would elapse before a repair would occur. October 25, a small bit of granulation tissue was excised from the wound and microscopically showed no definite tuberculosis. Smear from the wound at this time showed only one or two gram-positive cocci to a field, with less than one gram-negative bacillus. No acid-fast bacilli could be found. It was decided to close the wound by secondary sutures, and this was done, November 15, four months after nephrectomy. At operation, there was a large granulating cavity, which was lined medially by peritoneum covered by granulation tissue, and which extended upward under the ribs for about 6 cm. and downward almost to the brim of the pelvis. The cut edge of the muscles had retracted upward until the edge of the wound was about two finger breadths below the twelfth rib, and the lower edge had retracted downward about the same distance from the crest of the ilium.

The operation carried out was as follows: An incision was made surrounding the wound and about 1 cm. from the edge. This was carried down through the skin, subcutaneous tissue and muscle, and all scar tissue and granulation tissue was excised. Excision was not possible in the depths of the cavity, so this was well curetted out, all unhealthy looking tissue being removed. Three small iodoform gauze packs were then placed in the depth of the wound to stop the oozing that occurred, and the muscles and skin were closed by silver wire sutures placed as far from the cut edge as possible and drawn sufficiently tight to insure good approximation of the muscles and skin, care being taken, however, not to draw them tight enough to cause cutting. No buried sutures were inserted.

Pathologic report of the material removed at this operation showed definite tuberculous granulation tissue.

Following the operation, the patient's temperature rose for two days to 101 F., and there was reddening and induration around the edge of the wound so that some apprehension was felt as to whether or not it would heal. During this time the cavity was irrigated with meroxyl, 1:500, twice a day, and the patient received the usual hygienic treatment for tuberculosis. This continued for a week following operation, at which time there was marked improvement in the appearance of the wound.

The first silver-wire suture, which was at the lower angle of the wound and was the least important, was removed at the end of ten days. The second suture was removed in two weeks, at which time there was no induration or redness in the wound and the skin had healed by primary union and the muscle layers were healed and no subcutaneous separation of them could be made. The cavity, which before operation had a capacity of about 150 c.c., had reduced in size until only about 15 c.c. could be introduced for irrigation. The final silver-wire sutures were removed three weeks after operation, at which time the wound had healed along its entire length with the exception of a small area about 2 cm. long at the posterior angle, where the iodoform gauze packs had been inserted, and at the anterior angle of the wound a small sinus about 2 cm. long had developed, through which a slight amount of serous drainage emerged. It was noticed at this time that the anterior sinus showed very little tendency to heal, but the sinus at the posterior angle drained very little and was therefore allowed to heal up.

The patient was discharged from the hospital, Jan. 17, 1924, the wound entirely healed with the exception of a small sinus 1 cm. long and 0.25 cm. wide in the anterior angle of the wound, which drained a very slight amount of serous material. The phenolsulphonephthalein output on discharge was 50 per cent., the urine showed no tubercle bacilli and the urinary symptoms were greatly improved.

CASE 2.—A man, aged 40, admitted, May 7, 1923, complained of frequency of urination and hematuria. The past history was essentially negative, except for two attacks of gonorrhea in 1916 and 1918, and syphilis in 1918. The present illness began two and a half years previous with burning and frequency. This gradually increased until, on admission, the patient voided every half hour during the day and night. Since the first onset of symptoms, there had been several attacks of hematuria with the frequency. There was moderate burning and slight urgency.

General physical examination was essentially negative. There was no evidence of tuberculosis anywhere in the body except that which was demonstrated on urologic examination. The Wassermann reaction was negative.

Urologic examination showed a scar in the coronal sulcus of the penis. There was no urethral discharge, and no ulcers or tumors; the right testis, epididymis, cord and vas were normal; the left epididymis, cord and vas were normal.

Rectal examination showed a prostate of normal size. The right lobe was irregular, and firmer than normal, especially at the apex; there were slight periprostatic adhesions. The left lobe was similar to the right. The seminal vesicles were corded and thickened at their bases. The prostatic secretion showed a moderate excess of pus cells.

The urine was cloudy in three glasses, and no tubercle bacilli were found on repeated examination, but the urine contained pus and a small amount of blood. The phenolsulphonephthalein output was 90 per cent. in two hours.

Cystoscopic examination revealed a bladder capacity of 140 c.c. The bladder was quite irritable. Study of the prostatic orifice showed no hypertrophy or irregularity, but the orifice was quite red and edematous. The trigon was hyperemic and edematous. The right ureteral orifice was normal in appearance; the left ureteral orifice gaped widely and was surrounded by several small ulcerations covered with adherent mucus. The bladder mucosa was red everywhere, but more marked on the left. Ureteral catheters entered both ureters easily and ascended to the kidneys without meeting any obstruction. Specimens were collected, and tubercle bacilli were demonstrated coming from the left kidney.

The patient deferred operation until Jan. 7, 1924, when he was readmitted to the hospital and was operated on, January 9, nephrectomy being done. At operation the ureter was found to be greatly thickened and dilated until the lumen was about 1 cm. in diameter. It was quite irregular and definitely tuberculous. Therefore, as much as possible of it was removed after dissecting down retrovesically almost as far as the seminal vesicles.

The kidney removed showed early pyonephrosis with destruction of the papillae, and multiple tubercles scattered through the parenchyma of the cortex.

Following the operation, the patient had a marked febrile reaction, the temperature rose to 103 F., January 10, but on January 12, it was normal, and the patient's condition was quite satisfactory; and the wound had apparently healed nicely. January 25, sixteen days after operation, there was the first evidence of separation. The wound became indurated and red. Within two days several areas had broken down, and these enlarged in both directions until they united, and by February 9, the entire wound had broken down and a large granulation cavity, similar to that found in the first case, was present. This was treated with irrigations of mercurochrome-220 soluble, hydrogen peroxid and surgical solution of chlorinated soda from the time it broke down until Februray 28, at which time the smear showed only one or two gram-positive staphylococci to a field.

The situation at this time was identical with that present in the first case. There was a large cavity lined by tuberculous granulation tissue, which communicated with the exterior through the gaping lumbar wound, the edges of which had retracted so that the wound was about 2.5 cm. wide.

February 28, a bit of granulation tissue was removed from the wound and showed a tuberculous infection. It was decided, however, in spite of this, to attempt to close the wound. This was done, February 29. The operation consisted of excision of the wound edges, a margin of about 1 cm. being left. The skin, subcutaneous tissue and muscles were excised, and all unhealthy tissue was removed. The muscles were then closed with interrupted mattress sutures of No. 3 chromic catgut to the fascia of the internal and external oblique and transversalis. Each suture penetrated all three muscles, which were loosely brought together and tied. Silver wire stay sutures were then inserted at a distance of about 2 cm. from the edge of the wound, and traversing the entire muscle layer. The skin was closed with skin clips. The wound was not drained.

Pathologic report from the material removed showed tuberculous granulation tissue.

Following the operation, the patient had a slight reaction. The temperature rose, March 1, to 102 F. The posterior angle of the wound was found to be raised above the surface, and, when opened, about 10 cm. of serosanguineous fluid was evacuated. Dakin's tubes were inserted, and a dry dressing was applied. From March 2 until March 12 irrigations of surgical solution of chlorinated soda were instituted and, as in the previous case, the wound became somewhat red and indurated around the edges; but by March 14 this showed marked improvement, and by March 16 the edges were quite soft and not red or inflamed. March 20, it was first noted that the anterior angle of the wound was beginning to appear unhealthy, and therefore it was opened for drainage. Following this, the sinus at the anterior and posterior angles of the wound drained a moderate amount of seropurulent material, and irrigation of the cavity showed that it was becoming gradually smaller and smaller. The patient continued in this condition until April 22, when he was discharged from the hospital, fifty-five days after the closure of the wound and seventy-five days after nephrectomy. There was a small drainage tract at each angle, but the wound had healed completely with the exception of these, and there is little doubt that much time had been saved.

COMMENT

It will be noticed that in both of these cases the material removed at operation was tuberculous and, in spite of this, the wounds healed, except for small sinus tracts, which could drain the cavity. It would, of course, be highly desirable to obliterate this cavity at operation and in not so doing one is violating the cardinal principle in surgery of always obliterating any dead space; but this was technically impossible on account of its size and irregularity in shape. However, in these two cases the cavities had rapidly diminished in size, and on the discharge of the patients had almost disappeared.

Another observation of interest is that in both cases the anterior angle of the wound spontaneously established a drainage tract, and the posterior angle showed great tendency to heal. This would indicate that the anterior angle is the proper site of drainage. The results in these cases have more than vindicated the operation. By this procedure a large, gaping, indolent wound that incapacitated the patient has been converted into a healed wound except for two small sinus tracts, which were becoming progressively smaller during the last days of the patient's stay in the hospital.

The prognosis in regard to healing of the granulating without operation is ultimately good, but months would elapse before it would be complete, and by this procedure one is able to save the patient a long, tedious convalescence with the care and worry of a large granulating wound, which is always itself a menace to his health.

THE SURGICAL TREATMENT OF ACUTE PULMONARY ABSCESS AND CHRONIC PULMONARY SUPPURATION

WITH ESPECIAL REFERENCE TO THE POST-TONSILLECTOMY TYPE *

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Pulmonary infection is a fairly common postoperative complication, and the accompanying pathologic changes vary according to the avenue of infection, the amount, distribution and virulence of the infective organism, the relative resistance of the patient, the length of time the infection has been present, and the treatment. If abscesses result, they vary greatly in size and location. They may be simple, multiple or multilocular. They are usually surrounded by a peripheral zone of pneumonia, which may be circumscribed or extensive, and in various stages of resolution or liquefaction. In the more chronic stages, purulent bronchitis or bronchiectasis usually develops. Long continued infection results in thickening of the walls of the abscess, of the adjacent pleura, and fibrosis of the lung. For such a variety of pathologic lesions there can be no single descriptive term, but "chronic pulmonary suppuration" seems the most comprehensive and adequate.

In a series of 692 cases of acute abscess or chronic pulmonary suppuration observed at the Mayo Clinic, 146 (21 per cent.) followed operation. Of the postoperative cases, 31 per cent. followed tonsillectomy performed elsewhere; fourteen (9.5 per cent.), extraction of teeth, and thirty-eight (26 per cent.), laparotomy. With a few exceptions, these operations were performed under general anesthesia.

Abscess in the acute stage following tonsillectomy is typically localized to a circumscribed area of the lung, but may be widely distributed from the onset. In the chronic stages, all the foregoing lesions have been observed. A chronic diffuse bronchiectasis may result in cases in which the abscess heals. In 1911, I observed a case of abscess following tonsillectomy at the Massachusetts General Hospital that came to necropsy. The

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first case in the literature was reported by Richardson [1] in 1912. This patient came to the Mayo Clinic for treatment of the pulmonary abscess. He was operated on and recovered completely. Forty-eight patients with various types of pulmonary suppuration have been observed at the Mayo Clinic; forty-six patients had had tonsillectomy elsewhere, and two at the Mayo Clinic. This series of forty-eight cases, forty-seven hitherto unrecorded, form the basis of this paper.

TABLE 1.—*Data Concerning Forty-Eight Mayo Clinic Cases*

	Patients
Under 10 years	2
From 11 to 20 years	1
From 21 to 30 years	21
From 31 to 40 years	16
From 41 to 50 years	6
From 51 to 60 years	2
Males	27
Females	21

PRECEDING THROAT INFECTION

At time of operation	2
Within one week of operation	7
One to two weeks before operation	3
Time not specified	12
Not mentioned	24

DURATION OF SYMPTOMS	Patients Operated On	Patients Not Operated On
Ten days	.	1
Five weeks to two months	5	5
Two and one-half to three months	3	2
Three and one-half to four months	1	5
Four and one-half to five months	2	1
Five and one-half to six months	2	1
Six to nine months	5	2
Nine and one-half to twelve months	2	.
One to two years	5	2
Two to three years	1	.
Three to four years	.	1
Four to five years	1	.
Six years	1	.

LOCATION OF THE ABSCESS	Patients Operated On	Patients Not Operated On
Right upper lobe	7	4
Right middle lobe	1	1
Right lower lobe	8	1
Left upper lobe	4	4
Left lower lobe	4	7
Right lung	3	1
Left lung	1	.
Both lungs	.	1
Bilateral bronchiectasis	.	1

ANESTHETIC	Patients
Ether	23
"General"	9
Local	3
Not mentioned	13

Since Richardson's communication in 1912, there has been a progressively increasing number of cases reported. In 1921, Fisher and Cohen [2] collected reports of seventy-one from the literature, and added five cases of their own. The next year, Chipman [3] brought the number up to 124. Moore [4] added 202 unreported cases. The present series of forty-eight cases from the Mayo Clinic makes 374. The cases reported since 1922 bring the total of the published case reports to well above 400. Probably a considerable number still remain unrecorded, and it is reasonable to assume that many have not been recognized.

I shall not attempt to pass judgment on any of the excellent studies dealing with the technical aspects of the operation in these cases. My object is simply to emphasize the importance of prophylaxis against post-tonsillectomy pulmonary infection, to point out analogies that exist between pulmonary suppuration following tonsillectomy and other types of operations, and in particular to discuss treatment (Table 1).

ETIOLOGY

In certain cases, the infection is undoubtedly embolic. Severe symptoms and widespread pulmonary involvement are indicative of such origin. One of the Mayo Clinic cases was of this type. Tonsillectomy was performed under local anesthesia without incident. On the second day, the patient had two chills; the temperature rose to 101, the pulse to 95, and respiration to 40, and pain in the chest was complained of. On the third day, there were signs of a dry pleurisy. The further course was marked by the clinical manifestations of an overwhelming sepsis, the temperature rising to 106. The patient died on the tenth day following the tonsillectomy. Necropsy revealed multiple thromboses of the veins of the neck, multiple hemorrhagic infarcts of both lungs, and bilateral septic embolic pneumonia. In no other case in the series was there definite evidence of an embolic origin, either clinically or at necropsy.

The time of onset of any one or more of the initial symptoms, malaise, cough, fever, pain, foul taste or odor, or chilliness, can scarcely be taken as a criterion of the mode of infection, since they could conceivably be caused from either an early lesion in a small bronchus or from a solitary embolic focus. The symptoms occurred immediately after operation in seven cases; in two days in five cases; in three days in four cases; in from four to seven days in seven cases; in from ten days to two weeks in twelve cases; in from two and one-half to three weeks in four cases, and in from four to six weeks in one case. The date of onset was not mentioned in eight cases. This time sequence, in relation to other features of the individual case, does not seem to be indicative of the avenue of infection.

The condition of the patient's throat seems of some significance with regard to the relative frequency of postoperative complications. So common is the sequence of acute cold, pharyngitis or tonsillitis and postoperative pulmonary complications that it is a universal rule at the Mayo Clinic to postpone operation in all such cases unless immediate operation is urgently indicated. It would seem that tonsillectomy particularly should be postponed in the presence of throat infection. In two of the cases in the series, tonsillectomy was performed during the infection, within a week in seven cases, and within two weeks in three cases. In two cases, it was performed during an attack of quinsy and peritonsillar abscess, respectively.

It is generally believed that, in most cases, post-tonsillectomy suppuration is due to aspiration of infected material during or following operation. There is much evidence to support this view. It is quite probable that infected blood is often aspirated into the bronchi. Myerson [5] made a direct laryngoscopy and tracheoscopy after bleeding was entirely controlled in 100 cases in which tonsillectomy was performed under general anesthesia. He found blood in the trachea and bronchi in seventy-nine. Whether or not an abscess follows depends, probably, in large measure on the amount and virulence of infection, on the general condition of the patient, and on the presence of any pathologic condition of inflammatory character in the lung.

1. Richardson, C. W.: Abscess of the Lung Following Operations on the Tonsils and Upper Respiratory Tract, Laryngoscope **26**: 1001-1007 (July) 1916.

2. Fisher, Lewis; and Cohen, A. J.: Pulmonary Abscess in Adults Following Tonsillectomy Under General Anesthesia, J. A. M. A. **77**: 1313-1317 (Oct. 22) 1921.

3. Chipman, C. N.: Relation of Anesthetic to Pulmonary Abscess Following Nose and Throat Surgery Under General Anesthesia, J. A. M. A. **79**: 539-543, 1922.

4. Moore, W. F.: Pulmonary Abscess: An Analysis of Two Hundred and Two Cases Following Operative Work About the Upper Respiratory Passages, J. A. M. A. **78**: 1279-1281 (April 29) 1922.

5. Myerson, M. C.: Pulmonary Aspects of Tonsillectomy Under General Anesthesia, Laryngoscope, **32**: 929-942, 1922.

Perhaps the strongest argument in favor of aspiration infection is the fact that in 269 (85.9 per cent.) of 313 cases, tonsillectomy was performed under general anesthesia, and the highest incidence of infection was among patients operated on in the sitting posture. Aspiration pneumonia and suppuration following general anesthesia for various other surgical procedures certainly are not new or rare observations. In many cases, aspirated gastric contents have been found in the bronchi at necropsy. In the fourteen cases, observed at the Mayo Clinic, of pulmonary suppuration following extraction of teeth, the tooth was demonstrated in the lung by the roentgen ray, or at necropsy in several. In another case, a tooth was found in the dressings of a thoracotomy wound in which drainage of an abscess had been established. In several instances in which the presence of the tooth was not demonstrated at the time of examination, the patient later coughed it up. The cases that have followed tonsillectomy under local anesthesia may perhaps be in part accounted for by the obliteration of the protective laryngeal reflex by the local anesthetic. The finding of septic thrombi in the operative field following tonsillectomy would seem of small significance as an avenue of infection, in view of the fact that such thrombi could probably be demonstrated from any infected wound in a vascular field. Infection following thyroidectomy is not uncommon, but pulmonary abscess following thyroidectomy is not sufficiently common to have attracted attention.

It is significant that, among 16,000 tonsillectomies performed at the Mayo Clinic under local anesthesia, and among 4,000 tonsillectomies in children under general anesthesia, only two cases of pulmonary suppuration have occurred, and one of these was of the multiple abscess type associated with thrombosis of the jugular veins and other features suggestive of an embolic origin. In other clinics in which local anesthetics are used as a routine, similar freedom from this complication has been noted.

From the standpoint of etiology, two facts seem definitely established: that the great majority of pulmonary complications following tonsillectomy are due to aspiration infection, and that the great majority of them followed operation under general anesthesia.

TREATMENT

The treatment, to be rational, must be based on the pathologic anatomy of the suppurative process, which, as has been indicated, is of several types, and presents many variations. Indications for treatment must also be based, in each individual case, on the clinical course. Expectant treatment is indicated during an associated pneumonia and in the incipient stage of the abscess in all cases. The end of the incipient stage is usually marked by the sudden onset of purulent sputum in large amounts. Expectant treatment is indicated also in all cases in which there is progressive improvement, and in which patients do not become steadily worse during a period of from one to two months. If the abscesses are multiple and widely distributed, and in cases in which a purulent pneumonic process or pleural thickening make localization uncertain or impossible, there is also no other alternative but to treat the patient expectantly in the hope that improvement will occur, or that localization will later be possible. Of twenty patients in the series treated expectantly, five could not be traced; three progressed to a spontaneous cure; eight had symptoms at the last report, and four are known to have died.

Localized uncomplicated abscesses that do not show unmistakable signs of improvement after a limited time should be treated surgically. A large proportion of such cases treated expectantly run a fatal course, or eventually the patients present themselves for treatment after irreparable damage has been done. Such chronic conditions, presenting multilocular or multiple cavitations involving often the larger part of the lung, and with an associated bronchiectasis, often bilateral, and with secondary damage to other vital organs, are among the most difficult that confront the surgeon. Two thirds of the cases in the series were examples of such chronic suppuration. The duration of the suppurative process was ten days in one case; from one to three months in fifteen cases; from three and one-half to six months in twelve cases; from six months to one year in nine cases; from one to two years in seven cases, and from three to six years in four cases.

The principles involved in surgical treatment are the promotion of drainage through the bronchus, drainage through the chest wall, and extirpation of the diseased portion of the lung. These results are obtained by pneumothorax collapse, extrapleural thoracoplasty, thoracotomy and lobectomy. Operations based on each of these principles have their particular indications.

Pneumothorax.—Pneumothorax collapse of the lung, when indicated, is a safe, conservative method, and has yielded gratifying results. It is indicated especially in cases of centrally located abscess, both because such abscesses are favorably situated for drainage through a bronchus, and because of the difficulties and hazards of hemorrhage involved in attempting to drain them through the chest wall. The collapse of the lung in such cases promotes drainage, and lessens absorption and the tendency to extension of the process. It is contraindicated in cases of peripheral abscesses, because of pleural adhesions, which prevent pulmonary collapse, and because of the risk of perforation of such an abscess into the pleural cavity, causing a secondary empyema, a serious and often fatal complication. In case of multiple abscess, pneumothorax collapse is ineffectual, partly because of the reasons mentioned, and because such abscesses, if small, do not drain into the bronchus.

The technic of pneumothorax collapse is simple. A gradual collapse achieved by injecting from 300 to 500 c.c. of filtered air at intervals of two or three days is safe and effective. The results in early cases have been favorable. The method was used in three cases in the series before the patients came to the clinic; in two, the lung has been allowed to reexpand. These two patients both had large, well defined abscesses, and one of them had multiple abscesses. The third patient had a partially collapsed lung. The pneumothorax treatment was continued and, when he found it necessary to leave, he was advised to have the lung kept collapsed. This, however, he failed to do. He returned four months later with the lung reexpanded and the pleurae adherent. At that time he was raising from 1 to 2 liters of pus daily.

In acute, centrally located pulmonary abscess, pulmorary collapse has yielded good results. Tewksbury [6] has reported twenty-five cases in which twenty patients were cured, one was improved, and four died (Chipman).

6. Tewksbury, W. D.: Acute Pulmonary Abscess: Report of Fourteen Cases Treated with Artificial Pneumothorax, New York M. J. **110**: 849-851 (Nov. 22) 1919.

Extrapleural collapse is based on the same principle as that of pneumothorax. Its advantages are that it is a permanent collapse and can be accomplished in the presence of pleural adhesions. It is suitable chiefly in the chronic cases, and especially in those in which there is a residual bronchiectasis, and in which an associated pleuritis makes localization of the lesion impossible. The technic has been described in detail elsewhere.[7] It consists of the resection, in stages, of the whole length of all the ribs over the affected portion of the lung. The operation can be performed painlessly under local anesthesia, and, by injecting the intercostal nerves with alcohol, the convalescence can be made relatively painless. In eighteen operations that I have performed there was no mortality, and the results were uniformly good. In three cases of multiple chronic abscess, and in one in which a thickened pleura masked all lung signs, graded thoracoplasty was performed. Two patients died from septic pneumonitis, and two recovered, were almost free from symptoms, had gained much in weight, and had improved greatly in general.

Drainage.—Thoracotomy drainage is the operation of choice in all cases of solitary abscess not centrally located, and which do not show unmistakable progress toward a spontaneous cure. To treat such cases expectantly for an indefinite period is to invite all the changes characteristic of chronicity and the hazards and difficulties of their treatment. To attempt pneumothorax collapse in case of an abscess impinging on the parietal pleura is an irrational and dangerous procedure. Drainage through a bronchus is almost sure to be incomplete. Often the cavity contains sphacelated lung tissues, and if there is sufficient freedom from adhesions to allow the lung to collapse, there is the risk of perforation into the pleural cavity. The nearest and most direct outlet for the pus from peripherally situated abscesses is through the chest wall. In borderline cases in which the abscess is situated in the intermediate zone between parenchyma and pleura, it may be difficult to decide between the two methods.

I have described the technic of thoracotomy elsewhere.[8] The operation is performed under local anesthesia. Accurate localization with reference to the point selected for drainage is of the first importance. Fluoroscopic and stereoscopic localization with respect to certain landmarks on the chest wall are essential. The periosteum is separated from one, two or three ribs, but the ribs are not sectioned until later. If adhesions between the pleurae are present, the abscess is located with the aspirating needle. The ribs are then resected, and drainage is effected by burning a tract into the abscess with the cautery. If adhesions are not present, the lung is sutured to the parietal pleura around and under the ribs. Drainage is then effected from five to seven days after the pleural adhesions have formed. This is the best safeguard against empyema, which is the most common and fatal complication following drainage of pulmonary abscesses. The ribs are left in place until drainage is instituted, because, in my experience, primary rib resection interferes with coughing up pus from the abscess during the interval between the two operations. If patients are very sick and immediate drainage is urgently indicated, an attempt is made to locate the abscess after suturing the pleurae, and drainage is instituted at once, following rib resection.

Exploratory aspiration for localization of an abscess without preliminary thoracotomy to prevent infection of the pleural cavity is, in my opinion, an unjustifiable procedure because of the risk of contaminating the pleural cavity. The results from drainage operation for peripherally located abscesses, in view of the fact that the cases were chronic, with more or less extensive secondary lesions, have been relatively satisfactory; it was performed in twenty cases in the series, with 70 per cent. cures or marked improvement, and 30 per cent. mortality (Table 2).

TABLE 2.—*Duration of Abscess and Cause of Death*

Cases	Duration of Abscess	Cause of Death
1.	Thirty-three days	Multiple right pulmonary abscess, bilateral bronchopneumonia
2.	Fifty-two days	Bilateral pulmonary abscesses; empyema
3.	Fifty-four days	Multiple unilateral abscesses showing no tendency to localization
4.	Six months	Empyema present 12 hours after operation and terminating fatally in forty-eight hours; spirilla and fusiform bacilli were isolated
5.	Seven and one-half months	Empyema, purulent pericarditis, acute myocarditis, bronchiectasis
6.	Two years	Multiple multilocular abscesses with profuse fatal hemorrhage

In many cases of suppuration following tonsillectomy, the abscess is multilocular from the onset. In others, secondary abscesses develop after drainage of the primary one. In the more chronic cases, there is often extensive associated pneumonitis, fibrous thickening of both lungs and pleurae, and bronchiectasis, which make either collapse or drainage treatment ineffective. For such cases, the only treatment that offers a reasonable prospect of cure is extirpation of the diseased portion of the lung. Such patients are practically always relatively poor surgical risks, and the operation must perforce be performed in an infected field. It is not surprising, therefore, that primary lobectomy under such conditions has given a very high mortality. However, lobectomy following a graded thoracoplasty has been performed without mortality. The method of cautery lobectomy may prove the safest and most effective procedure in these cases, provided late hemorrhage does not prove a too frequent and fatal complication. I have performed such a partial cautery lobectomy in three cases, with hemorrhage in two.

In one, the hemorrhage was a contributory cause; in the other, the chief cause of death. The third patient made a good recovery.

ABSTRACT OF DISCUSSION

DR. M. C. MYERSON, Brooklyn: The thoracic surgeon and the bronchoscopist should be closely associated. The bronchoscopist should be sufficiently conversant with the clinical, pathologic and surgical phases of lung suppurations to know his limitations and realize early enough when to refer his cases to the surgeon. Bronchoscopic treatment, in order to be successful, must require that the abscess be single, of moderate or small size, and that there be no limiting fibrous wall or fibrous trabeculations. Obliteration of the cavity is the ideal result of treatment, and anything interfering with obliteration will prevent a cure. In other words, I would imply that fairly recent suppurations are the more desirable for bronchoscopy. If a patient appears for irrigations with a long standing lesion, he shows these signs: frequent cough; profuse expectoration of foul odor; lack of proper sleep; some loss of weight; temperature ranging between 99 and 102 F.; increased pulse rate; clubbing of the fingers and occasional night sweats. He may or may not have occasional hemorrhages. In such a case, one should do a bronchoscopy

7. Hedblom, C. A.: Pulmonary Suppuration, M. Rec. **96**: 441-453 (Sept. 13) 1919.

8. Hedblom, C. A.: Graded Extrapleural Thoracoplasty in the Treatment of Diffuse Unilateral Bronchiectasis, Arch. Surg. **8**: 394-406 (Jan., Part 2) 1924.

and irrigate the cavity. If after the third weekly or semiweekly irrigation there is not a decided change in the odor, character and quantity of the sputum, and in the patient's general physical behavior, it is better to refer that patient to the surgeon while he is still in good enough condition to withstand a surgical procedure. A cure cannot be claimed, no matter how much improvement is manifest, until a sufficient period of time has elapsed—two or three years. How often does such a "cured" patient develop a mild respiratory infection which lights up the involved area, so that we have to deal either with the same old problem or with an acute suppurative pneumonitis that may be fatal? These recurrences also are seen in cases of permanent lung fistula, but here adequate drainage takes care of the process very well. The bronchoscopist can definitely localize the suppurative lesion and demonstrate its every dimension by introducing into the cavity a suspension of bismuth in oil after the method of Lynah, prior to the taking of the roentgenogram. In a purely bronchiectatic suppuration, the insufflation of bismuth powder, after the method of Jackson, is of value. Bronchoscopy should be given a trial in every case of abscess that is not a frank surgical case. No harm can be done, while occasionally cases will be encountered which will respond favorably and go on to a cure. The bronchoscopic cure of a lung abscess saves the patient the suffering and mutilation of a major surgical procedure which is not entirely free of danger to life. Surgery should be considered the court of last resort for these cases.

DR. CARL A. HEDBLOM, Rochester, Minn.: I only wish to emphasize what I have already stated, that the pathology of pulmonary suppuration varies a great deal, and to recommend any one method of treatment is irrational. I should like to differ with the statement that all cases of bronchiectasis are bilateral. I have a number of patients with bronchiectasis who have coughed up liberal amounts of sputum for from five to twenty-eight years, and following an extrapleural thoracoplasty on one side the patient has become symptom free. If it had been bilateral bronchiectasis, we should not have had that result. There is a tendency to bilateral involvement, but I think that there is a large group of early stage unilateral involvement. I also wish to say, in reply to Dr. Myerson, that surgery should not be the last resort in pulmonary suppuration. Thoracic surgery is still in an undeveloped stage, but I think the time will come when that will not be true. Early accurate diagnosis with respect to both the nature and localization of the lesion, prompt treatment, the type of treatment being based on the pathologic condition present and the clinical course, will be productive of a great advance in the treatment of this serious and difficult condition.

The Goal of Medical Education.—Every newly qualified practitioner should be familiar with health as represented by normal structure and function, recognizing, of course, that the latter are capable of considerable variations in respect to particular individuals or particular organs. In the second place he should have at his fingers' ends, and be able to carry out, all the ordinary tests employed in medicine for detecting variations from normal function. He should, for instance, be able to detect a flaw in the function of the pyramidal system, an inadequacy of renal function, or a deficiency on the part of the thyroid gland with some degree of alacrity and confidence. In the third place he should be thoroughly acquainted with morbid processes, whether of degenerative, vascular, inflammatory, or neoplastic origin, and capable of recognizing the alterations in structure which they produce. Fourthly, and this is perhaps the most important part of his equipment, he must be intimate with the natural history of disease as illustrated by its clinical course. Lastly, he should be well grounded in the established principles of treatment, realizing, as we must, that therapeutic measures are very unstable and dependent largely on the vogue of the moment.—Buzzard, E. Farquhar: The Evolution of Neurology and Its Bearing on Medical Education, *Lancet* 2:790 (Oct. 18) 1924.

COLONIC ANESTHESIA*

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As long as seventy-seven years ago, the idea of rectal anesthesia originated, and its gradual development has been most fascinating and successful. Roux [1] first suggested colonic ether anesthesia in 1847. Pirogoff [2] of St. Petersburg reported the same year on the use of ether mixed with water by rectum. Magendie soon called attention to its dangers and substituted ether vapor for the solution with markedly better results. However, no following was obtained for this method, although several reports appeared in the literature around that time. The next reference appeared thirty-seven years later, when in 1884 Yocum of Copenhagen and Molière [3] of Lyons reported on the use of hand bellows in forcing ether vapor into the rectum, and later on the use of an India rubber tube connected with an ether container immersed in water at 122 F. In the same year, Weir [4] and Bull [5] reported the use of rectal etherization with grave results, which was confirmed by other authors. Bloody stools, rectal irritation, inability to control the stages of narcosis and measure the amount of vapor entering the rectum caused the second failure of the rectal method to gain recognition.

The first noteworthy advance was made in 1902, when Cunningham and Lahey [6] of the Boston City Hospital devised an apparatus for introducing ether-laden air into the colon. From that time on, during 1903 to 1910, many authors reported a series of cases which demonstrated the practicability of the Cunningham method.

In 1910, Sutton [7] constructed a new apparatus in which ether-oxygen vapor was introduced into the rectum, and he reported 140 cases in which operation was performed with this method of anesthesia, mostly in Dr. George E. Brewer's service at the Roosevelt Hospital, New York. There does not seem to be any special reason why this method again fell into disuse except that it required an extensive and rather complicated apparatus, and that unpleasant sequelae were rather frequently seen.

A new principle was then introduced by Dr. James T. Gwathmey [8] of New York, whose publication in 1913 marked the first notable advance in the safety of the technic of colonic anesthesia. In that year he made his report on experimental work with an ether-oil mixture before the International Medical Congress in

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* From the Surgical Service of the New York Skin and Cancer Hospital.

* Read before the meeting on anesthesia in the Section on Miscellaneous Topics at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

1. Roux: J. de l'Acad. d. sc., 1847, p. 18.
2. Pirogoff, N. J.: Recherches pratiques et physiologiques sur l'etherisation, St. Petersburg. F. Bellizard, 1847.
3. Molière, D.: Note sur l'etherisation par la voi rectale, Lyon méd. **45**: 419 (March 30) 1884.
4. Weir, R. F.: On the Danger of Inducing Anesthesia by the Rectum, M. Rec. **25**: 508 (May 3) 1884.
5. Bull, W. T.: On Etherization by the Rectum, M. Rec. **25**: 477 (March 3) 1884.
6. Cunningham, J. H., and Lahey, F. H.: A Method for Producing Ether Narcosis by Rectum, with the Report of Forty-One Cases, Boston M. & S. J. **152**: 450 (April 20) 1905.
7. Sutton, W. S.: Anesthesia by Colonic Absorption of Ether, Ann. Surg. **51**: 457 (April) 1910.
8. Gwathmey, J. T.: Oil-Ether Anesthesia, New York M. J. **98**: 1101 (Dec. 6) 1913; Oil-Ether Anesthesia: An Attempt to Abolish Inhalation Anesthesia, ibid. **99**: 211 (Jan. 31) 1914; Some Facts Not Generally Understood About Oil-Ether Colonic Anesthesia, Laryngoscope **25**: 692 (Oct.) 1915.

London. In 1915, he published a paper [9] that will always stand as a complete reference work on this subject.

The favorable results obtained may be explained by well known laws of physics. Chief, perhaps, among these is the constant, slow liberation of the ether from the oil over a period of a few hours, and consequently its slow absorption, rather than the overwhelming effect of a single dose. Other effects, as the physiologic and psychologic causes, will be discussed later.

Results of experience have borne out the early results of the experiments, and the experience of more than ten years now enables a fairly definite statement as to the advantages, the safety, and also the limitations of this method.

The basic requirement of a general anesthetic is that it shall produce analgesia with the minimum of risk. The analgesia need not be accompanied by complete unconsciousness, but it is essential that the patient be quiet. In operations about the head and chest, the requirements of convenience and perfect asepsis make it desirable to have the anesthetist and his mask out of the way. These desirable conditions are a great merit of colonic anesthesia; but it possesses the additional quality of being probably one of the safest methods of administering a general anesthetic known at the present time. If the test of safety is the freedom of ill effects in admittedly bad surgical risks, then colonic anesthesia has earned its right to be so considered; for, in the experience of the New York Skin and Cancer Hospital, where so many of the patients are elderly persons with advanced visceral changes, and the debilitating consequences of their carcinomatous conditions, it has been found that the recovery from operation has been unusually free from the sequelae that seemed formerly to be an unavoidable sequence of operations in these cases.

For purposes of clearness, I will consider, first, the physical, then the physiologic, factors, and finally the technical details and results of personal experiences.

PHYSICAL FACTORS

In cooperation with Dr. Gwathmey, experiments were made by the late Dr. Charles Baskerville,[10] professor of chemistry of the City College of New York, and Dr. George Barclay Wallace, professor of pharmacology of the Bellevue Hospital Medical College, to study the rate of evaporation of ether from various oils. The facts were ascertained that while ether boils at 34.6 C., it does not escape as violently from an ether-oil mixture as from an ether-water mixture, even when the mixture is heated higher; namely, 37 C., or body temperature. The rate of evaporation of ether from oil quickly acquires a definite and fairly fixed speed. Dr. Baskerville showed that, regardless of whether the oil was mineral, vegetable or animal, or whether a 25, 50 or 75 per cent. mixture was used, the rate of evaporation remained constant. He devised charts which show that ether evaporated regularly and constantly, both in time and in quantity. Therefore, even the most skeptical must be convinced that ether-oil colonically is a safe procedure and admits of an even plane of anesthesia. The patient does not absorb a tremendous amount of ether immediately on injection, which would result in anesthetic shock, but the patient becomes gradually anesthetized in accordance with the constancy in evaporation of the ether from the mixture in the colon. This is important, as thus a proper content of ether may be maintained in the blood to produce the surgical stage of anesthesia. The entire amount of the required ether must all be given at one time in order to establish the ether tension in the blood, necessary to produce anesthesia. It may be separated rapidly from oil at any time by warming, but at body temperature passes off slowly. The gradual liberation of the ether from the oil in the colon and its slow absorption, referable to the cooling produced by evaporation, is undoubtedly an element in its safety. After the mixture has been run in, it is impossible to remove the ether and leave the oil, or vice versa. Each molecule of one is apparently bound to a molecule of the other, and they can be separated only by vaporization. The anesthesia, once established, is automatically maintained, by:

1. The constant rate of ether vaporization from the oil.
2. The distention of the colon, which permits less ether to be absorbed than when the colon is only partially distended. This distention of the colon has been found to be caused by the ether-oil mixture.
3. The cooling of the colon and the mixture during the evaporation of the ether which retards its elimination and absorption.
4. The difference of the ether absorptive power of the colon and the elimination capacity of the lungs.

Since the degree of vaporization never varies, it is impossible to have deep anesthesia at one moment and light at another, unless purposely done by either covering the face for rebreathing and deeper anesthesia, or by introducing a pharyngeal tube for aeration and light anesthesia.

PHYSIOLOGIC FACTORS

Probably the most important physiologic factor is the psychic one. There is no fear on the part of the patient of the anesthetic, or the dreaded "going upstairs to the operating room." There is just the amazement of the patient to wake up and find the operation completed, and himself back in bed. Lathrop [11] of Hazelton, Pa., in reporting a series of more than a thousand cases, used colonic anesthesia in 166 cases of goiter that showed hyperthyroidism and exophthalmos, with excellent results. He and Brinkley [12] proposed to get the patients with exophthalmic goiter used to the procedure by giving an enema every day, with the addition of a few drops of ether, so that the patients became accustomed to the odor of the ether and the enema. They are told that this is part of the treatment. They will then be unaware of the actual giving of the ether-oil anesthesia on the day of the operation, and will simply fall asleep only to awaken after the operation is completed. As the ether-oil mixture is administered in bed, the patient stays there and falls into a natural sleep.

In colonic anesthesia there is practically no excitement, as is often seen in the first stage of inhalation anesthesia. Within five minutes after the mixture is allowed to run into the rectum, it is heated to body temperature and some ether leaves the oil as a gas and is absorbed by the capillaries of the colon. It is then carried through the liver to the heart and lungs, where some of it is eliminated. The remainder stays in the blood and is carried to the brain and central nervous system. From the observation of the absence

9. Gwathmey, J. T.: Ether-Oil Colonic Anesthesia, American Year Book of Anesthesia and Analgesia, 1915.
10. Baskerville, Charles: On the Rate of Evaporation of Ether from Oils, and Its Application in Ether-Oil Colonic Anesthesia, Am. J. Surg. **30**, January, 1916; Quart. Suppl. Anesth., pp. 20-25.
11. Lathrop, Walter: Colonic Anesthesia, New York M. J. **107**: 679 (April 13) 1918.
12. Brinkley, A. S.: Colonic Use of Ether-Oil, Am. J. Surg. (Anesth. Supp.) **32**: 31 (Jan.) 1918.

of irritation of the kidneys and stomach, the hypothesis may be derived that probably they are spared by the gradual liberation of the ether from the oil and the slow absorption of the ether from the colon, which allows smaller quantities to enter these organs and gives them a chance to accommodate themselves to the chemical irritation more easily than they do to overwhelming amounts that enter in some inhalation anesthesias. In inhalation anesthesia, the ether enters the capillaries of the lungs directly, and at once, after passing through the left side of the heart, is pumped through the systemic circulation; while in colonic anesthesia the ether, slowly absorbed, enters the venous circulation and the right side of the heart first, where it is already attenuated, and then enters the lungs, where some of it is eliminated, and only thereafter enters the left side of the heart, from which it is pumped through the systemic circulation. The ether, passing over the mucous membrane of the bronchi, trachea and pharynx, well attenuated, moistened and warmed, by coming from within, acts without local irritation. Hence there is practically no secretion of mucus, and consequently less danger of pneumonia. The hunger for air, not infrequently observed during the usual methods of inhalation anesthesia, and the great labor of difficult breathing with the accompanying cyanosis and exhaustion at the end of an operation, are absent in colonic anesthesia. The patients breathe quietly and easily as if they were in a natural sleep, and can use all their strength, vitality and reserve power to combat the general shock of the surgical interference. Aeration of the blood goes on normally, and cyanosis is absent. Therefore, bleeding from the superficial vessels will be lessened. Pulse and respiration seldom vary, and the temperature remains the same. The cold, clammy skin sometimes seen in inhalation anesthesia does not occur. There is muscular relaxation. The olive oil restores the opsonic index and the reactive and combating powers of the body, which are lessened by an ether anesthesia, as has been shown by Evarts A. Graham.[13]

The margin between full surgical anesthesia and a toxic dose is greater with colonic anesthesia than with any type of inhalation anesthesia. In colonic anesthesia, the first symptom of anesthesia is a sensory paralysis, especially of the extremities. The higher brain centers are the last to be affected. This observation is verified by the manner in which the patient emerges from the anesthesia. Consciousness is regained long before sensations of pain are manifested. This is a strong factor in the wide latitude of safety of this method. In inhalation anesthesia, on the other hand, the higher centers of the brain are the first to be affected. Also a smaller hourly amount of ether is required than with any other method. The estimated amount is 2 ounces an hour, which varies within narrow limits. If the dosage is properly gaged, the patient is at no time in deep narcosis but is only analgesic and asleep. Reflexes are present, and he can swallow and cough up blood and mucus. It has frequently been an uncanny experience to remove the towel from the patient's face during the performance of a severe, prolonged operation, and to note that he has his eyes open and could answer questions intelligently, and yet seemed insensible to what must have been painful surgical manipulations. On returning to bed after the operation and first being awake, the patients usually fall asleep again, and sleep for many hours, needing no morphin to relieve the pain, and permitting rapid recovery with practically no nausea, vomiting, reflex intestinal paresis, or urinary symptoms. They often awaken without the realization that they have been operated on, and may ask the nurse or physician when the operation will take place, or why they are bandaged.

It is well known that the biggest shock in major operations is caused by loss of blood, handling of tissues, and loss of body temperature. Avoiding these factors, cancer operations of great magnitude, lasting many hours, are withstood by patients under colonic anesthesia splendidly. They react as if nothing had been done, and in some cases are up and about in a day or two.

INDICATIONS AND CONTRAINDICATIONS

Colonic ether-oil anesthesia is indicated in certain very obese individuals, with short neck, in any type of operation; in neurotics and the insane; in goiter and hyperthyroidism; in all operations about the head, neck, chest and upper respiratory passages and in certain cases of bronchoscopy and esophagoscopy. It has been used by some as a routine in hernia operations and laparotomies, but it does not seem wise to call it a panacea for all operative anesthesias and should be used only in strictly indicated cases. Age is no factor, except that the patient must be old enough to cooperate and retain the enema. Old patients, much reduced, stand it well. Sex does not make any difference. Disease, such as tuberculosis, bronchitis, bronchiectasis and empyema, is no contraindication, as the ether is not locally irritating.

The only contraindications are disease conditions of the intestines or colitis, hemorrhoids, ulcer, fistula in ano, and patients with advanced nephritis or such constitutional diseases as diabetes, in which ether itself is contraindicated and objectionable. It should not be used in emergency cases when the patients cannot properly be prepared.

TECHNIC

When it comes to the technic of colonic anesthesia, one must never forget that it is an anesthesia, and just like every other anesthesia, whether general or local, it must be carefully watched and conducted. A loaded rifle may be perfectly safe in the hands of an expert marksman, but in the hands of a novice it may do a great deal of harm. Just so is it with the administration of colonic anesthesia. It must be carefully handled and conducted, and the surgeon must constantly realize that his patient is not in possession of all his faculties, that he is anesthetized and needs observation, and especially to note that the tongue does not drop back when the patient is lying on the operating table. A trained anesthetist's presence in the operating room is most desirable to watch the patient and give supplementary inhalation anesthesia if required. Careful observation after the operation on the part of the nurses, as in all other cases of anesthesia, until the patient is out of the anesthetic, is also most important.

It is further important that the colon be thoroughly emptied before operation and not irritable. Therefore, a cathartic should be given at least forty-eight hours or more before the operation. Ten or twelve hours before operation, either in the evening or in the early morning, according to the time the operation is scheduled, morning or afternoon, a soap-suds enema is administered. Finally, about three or four hours before

13. Graham, E. A.: The Effect of Ether on Certain Processes of Immunity, J. A. M. A. 54: 1043 (March 26) 1910; The Influence of Ether and Ether Anesthesia on Bacteriolysis, Agglutination and Phagocytosis, J. Infect. Dis., March 6, 1911.

the operation, a tap water enema is given to be sure to get rid of all the feces, which absorb ether, and the soap-suds, which decompose the mixture.

An hour and a quarter before the operation, the patient is then given a suppository of 10 grains (0.65 gm.) of trichlor-tertiary-butylalcohol (chlorbutanol) and a hypodermic injection of one-sixth or one-fourth grain (0.01 or 0.016 gm.) of morphin with atropin. One hour before the operation, the ether-oil mixture is introduced into the rectum, according to the following procedure: The patient lies in the left Sims posture, and a small caliber rectal tube is inserted. The mixture, prepared in the hospital pharmacy and thoroughly shaken, is poured from a warmed, flannel-covered bottle, into a funnel attached to the end of the rectal tube, the rate being slow enough to require from ten to fifteen minutes for the procedure. The rectal tube is left in place and closed with a cork or clamp. The room is darkened, a cloth is placed over the patient's eyes, and cotton is put in his ears. Absolute silence must be maintained, and nothing must occur that will in any way attract or fix the patient's attention. So far as is possible, the environment must be such as to favor a natural falling asleep. As soon as sleep has been produced, the face is covered with a wet towel to favor rebreathing. Surgical anesthesia may be expected after from forty-five to fifty minutes.

The mixture itself is made up of ether, paraldehyd and olive oil. In judging the dose, it is better to keep on the safe side. The necessity of a brief initial inhalation anesthesia is not objectionable. The dosage of ether is gauged according to the size, habits, general make-up and demeanor of the patient, and the length of operation contemplated. The amount used varies between 2½ and 6 ounces (75 and 180 c.c.), the most frequent dosage being 4, 5 and 6 ounces (120, 150 and 180 c.c.), The paraldehyd is constant, 2 drams (7.5 c.c.). The olive oil is one-half the quantity of the ether used.[14]

Table 1.—*Standard Formulas*

Ether	4 oz.	5 oz.	6 oz.
Paraldehyd	2 drams	2 drams	2 drams
Olive oil	2 oz.	2½ oz.	3 oz.

After about an hour the patient may be removed to the operating room, remaining on his left side all the time until he is placed on the operating table. If he has been aroused by this procedure or is not deep enough under the influence of the anesthetic a few drops of supplementary inhalation may be given, but just enough to put him asleep, never to the point of making him snore. Only a few drops is required. As a matter of fact, the tendency on the part of the anesthetist to give too much is great; it must not be forgotten that the patient is simultaneously absorbing from the colon. All that is necessary is to quiet the patient sufficiently to put him to sleep. When the patient moves during the operation, it is not always necessary to supplement right away with inhalation anesthesia, as some movements are frequently again followed by quiet.

Should the surgeon or anesthetist have misjudged the dosage and the anesthesia become too deep, the danger signs manifest themselves in about fifteen minutes, and are loss of the conjunctival reflex, shallow respiration, slight cyanosis, stertor, and embarrassed respiration, as well as a weak pulse. Usually one is too easily alarmed. But, if the condition is disturbing, all that need be done is to open the rectal tube, which has been left in place, make pressure over the sigmoid to expel the remaining mixture, and if necessary flush out the colon with an irrigation given by a nurse while the patient is on the table, followed by the instillation of a hot coffee enema. The patient will then soon come out. In only those cases in which there is a patent ileocecal valve can the mixture get beyond the colon and out of reach. This condition could, of course, be determined by previous roentgen-ray examination with a barium clysma, but it has not seemed a factor of danger in our experience. Finally, if it seems necessary, an intravenous infusion with the admixture of 10 minims of epinephrin and one ampule of pituitary extract might be given.

On completion of the operation, the patient is brought back to bed, and *at once* gets a colon irrigation followed by a hot coffee enema. Morphin should not be ordered, nor is it necessary till the patient is entirely awake. The patient will usually sleep on quietly for many hours. It is of utmost importance, especially after operations on the jaw, to see to it that the tongue does not drop back.

ADVANTAGES

In summing up the advantages of colonic anesthesia in certain indicated types of cases, it may be said that:

1. It is safe.
2. It adds to the comfort of the patient.
3. It is easy to control, and may be terminated by withdrawal of the injected mixture.
4. It is simple to administer.
5. Its after-effects are negligible.
6. It is efficient.

It is efficient because:

1. The method insures the prevention of shock.
2. The narcosis is smooth and of uniform depth.
3. The pulse and respiration remain near normal without mucous râles.
4. There is little or no change in blood pressure.
5. The reflexes are not disturbed.
6. There is more complete muscular relaxation than in other methods of anesthesia.
7. The stage of excitement is eliminated.
8. The patient inhales a warmed moist ether vapor, so that irritation of the concentrated vapor is overcome.
9. The loss of body heat is minimized because of reduced perspiration and ether refrigeration.
10. In more than 95 per cent. of cases there is no eructation or vomiting during and after the anesthesia.
11. Hypersecretion of mucous and saliva is absent (the ether-oil is less irritating to the colonic mucous membrane than ether vapor to the respiratory mucous membrane).
12. The absence of the ether cone or mask lessens the technical difficulties of certain operations.
13. There is less hemorrhage in head operations.
14. The patient's stomach, kidneys and lungs are not taxed.
15. There is frequently analgesia without anesthesia.

STATISTICS

We will now take up the statistics of 149 consecutive cases of colonic anesthesia administered at the

14. Naturally, there have been many modifications in the technic and dosage of colonic anesthesia. For instance, Dr. Walter Lathrop of the State Hospital, Hazelton, Pa., writes that for the last years he has used the following technic in more than 400 cases very successfully: "The patient is given a hypodermic of 2 c.c. of a 25 per cent. solution of magnesium sulphate, containing one-eighth grain of morphin, every fifteen minutes for three injections. After the last hypodermic is given, the patient is given 1 ounce of ether in 3 drams of sweet oil by rectum, as of old. One and a half ounces may be given just as well. Then in half an hour, as a rule, we are ready to operate, and usually the patient converses freely during the operation, and has comparatively little pain. We also use at times a skin injection of procain, as morphin does not affect the peripheral nerves. We have used this method in a great many cases of thyroidectomy, in asthmatic cases, and in hernia cases, with uniform success. The ampules of morphin in magnesium sulphate are made for us, and thus are always on hand and ready for use. Also, the injection of one ampule in any case requiring morphin will give a much longer effect with less of the drug."

New York Skin and Cancer Hospital from Oct. 1, 1922, till Aug. 1, 1923, in the surgical services of Drs. George H. Semken, Franz Torek, H. H. M. Lyle and Clarence A. McWilliams. In many instances these cases were far advanced carcinomas, the patients coming to the hospital in a deplorable, emaciated, and often desperate physical and mental condition. Operation sometimes almost seemed impossible and contraindicated. Yet operations, radical and of great magnitude, were performed, as they gave the patient the last and only ray of hope. In such cases it may be stated that colonic anesthesia is ideal and has proved invaluable.

Instances which have been reported as accidents with colonic anesthesia could usually be traced to some error or faulty modification in technic.

Many surgeons, when thinking of colonic anesthesia, shudder at the thought of putting ether into the colon, and call it dangerous and unnecessary. But one ventures to say that once a surgeon has operated on a patient under a well conducted colonic anesthesia and has experienced its wonderful helpfulness, and the simplicity and advantages of its use, time after time, he will be just as enthusiastic over it as are the surgeons who have used it for many years.

The accompanying tables cover the statistics of the 149 consecutive cases, and have been prepared by one of us (B. F. R.), who was house surgeon at the New York Skin and Cancer Hospital during the period that they cover.[15].

TABLE 2.—*Patients Operated on*

	Number of Cases
AGE	
From 5 to 10 years	2
From 10 to 15 years	8
From 15 to 20 years	6
From 20 to 30 years	14
From 30 to 40 years	16
From 40 to 50 years	37
From 50 to 60 years	35
From 60 to 70 years	24
From 70 to 80 years	5
From 80 up	2
SEX	
Male	107
Female	42
GENERAL HEALTH	
Good surgical risks	98
Fair surgical risks	35
Very poor surgical risks	16
DIAGNOSIS	
Carcinoma of lower lip	25
Carcinoma of floor of mouth	10
Carcinoma of tongue, superior maxilla, or larynx	23
Carcinoma of breast	10
Carcinoma of face, jaw or nose	33
Burn contracture, plastic repair	18
Tonsillectomy	2
Miscellaneous	28

COMMENT

Colonic ether-oil anesthesia may be looked on as a very safe procedure. While formerly surgeons of the New York Skin and Cancer Hospital hesitated to operate in cases of advanced carcinoma for fear of the long inhalation anesthesia with the resulting frequent complications now, since the advent of colonic ether-oil the problem of anesthesia need not be considered and all the attention may be directed to the technic and execution of the operation. Postoperative pneumonia is sometimes seen; this, however, is not the result of the anesthesia but occurs in those cases in which there has been surgical intervention, in the mouth or the pharynx.

TABLE 3.—*Details of Operation*

	Number of Cases
TIME OF OPERATION	
From 0 to 1 hour	12
From 1 to 2 hours	43
From 2 to 3 hours	39
From 3 to 4 hours	38
From 4 to 5 hours	11
From 5 to 6 hours	6
AMOUNT OF ETHER USED	
2½ ounces	1
3 ounces	6
3½ ounces	2
4 ounces	26
4½ ounces	7
5 ounces	69
5½ ounces	4
6 ounces	34
RETENTION OF OIL-ETHER ENEMA	
Portion of enema expelled	4
Enema removed on operating table by irrigation on account of depth of anesthesia	4
Recovery	
From 5 to 10 minutes	1
Twenty minutes	2
Artificial respiration given 10 minutes	1
ANALGESIA WITHOUT NARCOSIS	
Patients were able to answer questions throughout operation in about half of all cases.	
SUPPLEMENTARY ANESTHESIA	
None required	63
Small amount of ether or chloroform at beginning	63
Occasional whiff throughout	17
Continuous administration	6
DEPTH OF ANESTHESIA	
All cases light or moderate except 5 cases: 4 washed out on table with good recovery; 1 deep, reported under death.	
RECOVERY FROM ANESTHESIA	
Uneventful	143
Slow	5
No recovery	1
BEHAVIOR DURING OPERATION	
Good	122
Restless, noisy, or falling back of tongue with difficulty in breathing	27
SALIVATION DURING OPERATION	
None	143
Slight	5
Moderate	1
STIMULATING DURING OPERATION	
Coffee enema	4
Saline infusion	6
CONDITION AT END OF OPERATION	
Good	116
Fair	30
Poor	3
POSTOPERATIVE SYMPTOMS	
Nausea and Vomiting	
Without supplementary inhalation	4
With supplementary inhalation (all nervous)	8
Abdominal Distention	
None	147
Moderate	2
(Had supplementary inhalation)	
Rectal Symptoms	
None	144
Slight pain and griping	5
MORTALITY	
2 deaths.	
Both deaths the result of unrecognized mechanical obstruction and suffocation, and not due to chemical causes of anesthesia.	

As a matter of fact, the two deaths reported are indirectly the result of the safety of the method, as they may be ascribed to the unavoidable absence of the nurse from the patient's bedside. Our nurses have been so impressed with the safety and smooth running of the cases that they left the patients alone in these two instances and, therefore, with the patients turning on their back, could not recognize the mechanical obstruction to breathing, caused by the falling back of the tongue, in time to save the patient from suffocation.

15. G. W. Cottis of Jamestown, N. Y., sent a questionnaire in 1923 to all the men who are known to have used colonic anesthesia. Answers were received from thirty-seven men, who reported a total of 7,073 anesthesias administered by this method. Of these, a total of six deaths was reported. Of these six deaths, four were reported by the surgeon or anesthetist as not being caused by the anesthesia, while one death was directly attributed to an error in dosage, and one was not detailed at all. H. D. Hatfield of the Kessler-Hatfield Hospital of Huntington, W. Va., writes: "I have been operating with colonic anesthesia for three years past and have used it in every type of case. We have given 1,500 cases or more, with the greatest of success; we have had no fatalities and no near ones. It is indeed by far the most pleasing anesthesia for the patient and satisfactory to the surgeon."

However, the lesson to be learned from these two deaths is the point that patients under colonic anesthesia should not lie flat on their back unless under continuous observation, so as to prevent a possible dropping back of the tongue and resulting suffocation.

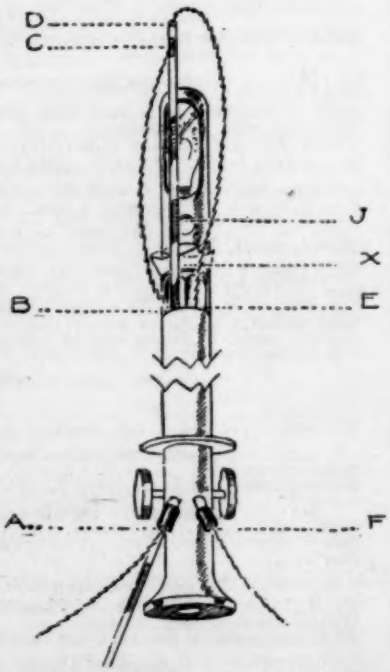
In other words, the two deaths, in our series of 149 consecutive cases, in which very careful and thorough statistics were kept, were not due to ether-oil colonic anesthesia as a method.

Clinical Notes, Suggestions, and New Instruments

USEFUL METHOD FOR REMOVING FOREIGN BODIES FROM THE BLADDER

FRANK BENTON BLOCK, M.D., PHILADELPHIA

It takes much courage to announce something new to the profession because, as a rule, after making such an announcement, one will be gently reminded by some colleague that our newly discovered pet was beautifully described ten or perhaps fifty years ago. For this reason, the method about to be discussed is described merely as a useful method of removing certain foreign bodies and calculi from the bladder differing in certain details from several well known methods. This method depends on the use of a ureteral catheter as a snare, and will be found to be of advantage when an operating cystoscope is not available or when the type of foreign body is such that it cannot be readily grasped by an operating forceps or ronguer on account either of its size or of its shape. The sketch shows the under surface of the double catheterizing cystoscope with a catheter in one of the channels.



Apparatus for removing foreign bodies from the bladder.

Before the catheter is introduced, a long silk ligature is threaded into the catheter channel from without inward (*A*), after the lens system has been disconnected from the sheath, until it reaches the objective end of the cystoscope (*B*). A ureteral catheter with an eye on the extreme tip as well as one on the side near the end is then threaded through the same channel with the silk. When the catheter tip reaches the objective end of the cystoscope, the silk ligature, threaded on a fine straight needle, is introduced into the catheter at the eye on the side (*C*) and brought out at the tip (*D*). The needle is removed and the ligature is threaded back through the empty catheter channel, entering at *E* and emerging at *F*. The lens system is then carefully replaced in the sheath and the cystoscope is ready for use.

After the instrument has been introduced into the bladder, the foreign body is located and the objective lens (*J*) is brought down on it or nearly on it. While this position is maintained, the silk ligature at *F* is gently pulled, which causes the tip of the catheter (*D*) to curve around and enter the channel at *E*. If the foreign body is kept in the center of the field and as close to the lens as possible during this maneuver, the combination of pulling on the ligature (*F*) and the careful use of the elevator (*X*) will cause the object to be fairly firmly wedged between the loop of the catheter and the elevator. The object to be removed, if small, will be pulled out of the field of vision as the loop is pulled tight. The cystoscope is then removed, the foreign body coming away with it. The method is applicable only to objects small enough to pass through the urethra, but may be used in either males or females. If this method has been previously described, I extend my apologies to its originator.

2035 Chestnut Street.

TOXIC HYPERTHYROIDISM OF NASAL ORIGIN*

SIMON L. RUSKIN, M.D., NEW YORK

It is acknowledged that toxic hyperthyroidism of nasal origin exists, and yet one frequently encounters cases that have had every other conceivable search for focal infection without a thorough investigation of the nasal accessory sinuses. In the case here reported, the patient was under care for four years without receiving a nasal examination.

REPORT OF CASE

B. D., a man, aged 54, a shoemaker, had complained for twenty years of dyspnea and cough, associated with persistent heaviness of the chest. For about five years prior to the onset of his present trouble, he had had asthma, which cleared up after a severe attack of vomiting. During the last fifteen years, he had had attacks of grip twice a year, each of which necessitated his staying in bed for several days. These attacks were always associated with severe colds in the head and with a profuse mucous discharge, which passed into the throat. He had a chronic cough, productive of thick green sputum.

After an infection of the finger five years ago, the patient's cough and sense of oppression in the chest seemed to become aggravated; he suffered from attacks of weakness and sensations of warmth, had a slight fever in the afternoon, frequently felt nauseated, had a poor appetite, and lost weight. The presumptive diagnosis in the first hospital that he entered for observation was pulmonary tuberculosis. After repeated negative sputum and roentgen-ray reports, the patient decided to go to another institution. There the case was diagnosed as lung abscess. A bulging of the eyes, rapid pulse, pronounced tremor, extreme weakness and severe cough developed, and the condition was then diagnosed as toxic hyperthyroidism.

When I first saw the patient, he was bedridden, emaciated and had no appetite. His pulse was 120; there was pronounced tremor and exophthalmos, but no enlargement of the thyroid. He had a cough and, particularly in the morning, coughed up several ounces of thick green pus.

Nasal examination revealed a marked anterior deflection of the septum to the right, and a hypertrophic rhinitis. In the right middle meatus, a streak of pus was visible. By posterior rhinoscopy, thick pus could be seen covering the posterior tip of the inferior turbinate, the epipharynx, and in streaks on the posterior pharyngeal wall. The larynx also showed a clump of the same purulent material in the interarytenoid space.

After anesthetizing the inferior meatus with 10 per cent. alypin solution, I punctured the right maxillary sinus and washed out a profuse amount of foul-smelling pus. Following repeated irrigation, the patient improved rapidly, his cough diminished, appetite returned, and the attacks of warmth ceased. His pulse decreased to 90, and he gained quickly in strength. After six weeks in the country, he returned weighing 20 pounds (9 kg.) more, and was strong enough to return to work. His nasal condition has cleared up almost entirely. At the last examination, his pulse was 70 and the tremor was considerably less. The exophthalmos was the same, although with his gain in weight it appeared less prominent. He had no dyspnea and only a slight sense of heaviness in the chest. Unfortunately, no basal metabolism determinations were made.

* From the Nose and Throat Department of the New York Post-Graduate Medical School.

COMMENT

This case is not an isolated example of the close relationship between nasal infection and hyperthyroidism; the milder and less spectacular cases often occur. Toxemia as a result of focal infection resembles in its symptomatology a mild hyperthyroidism, varying grades of which, associated with purulent nasal suppuration, are frequently observed.

351 West Eighty-Sixth Street.

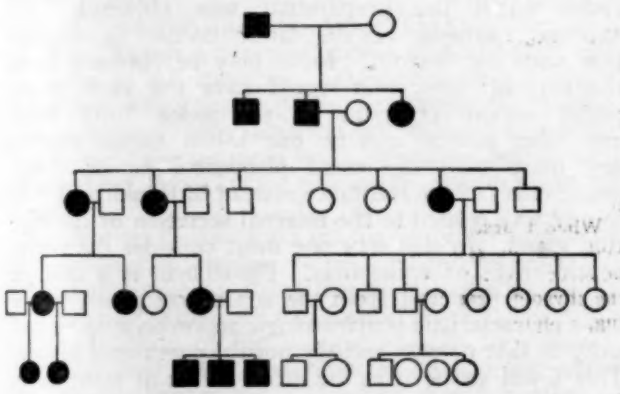
ANIRIDIA IN FIVE GENERATIONS *

HUGH L. DWYER, M.D., KANSAS CITY, KAN.

In the course of an examination of school children a few years ago, I encountered a child with hereditary absence of the iris. Tracing her family and relatives, I was able to find nine cases of aniridia and obtain a good family history of fifteen cases in five generations. Some of the children are in school but are seriously handicapped. On a casual inspection of the eye, there seems to be a total absence of the iris, although it is probable that on close examination tags or remnants of this structure remain, as is reported in the majority of cases examined.

In this anomaly the influence of heredity is most strikingly seen. The character behaves as a mendelian dominant.

The laws of heredity, so well worked out in plants and lower animals, encounter many obstacles in their application to conditions in man. This is due principally to the difficulty in collecting data, slow breeding, late maturity and small families. The first law of heredity, the phenomena of "segregation of characters," was discovered by Mendel, working with plants, and it has since been worked out in animals. It was found that when two opposite characters were crossed, only one of the characters appeared in the offspring. This character is termed the "dominant," and the suppressed character the "recessive." If now the product of this first filial generation, the hybrids, are mated, both characters



Pedigree of a family with aniridia.

appear in the offspring. Mendel demonstrated this segregation of characters in the mating of hybrids. And at this point the application of the mendelian law to man meets with difficulty. It is manifestly impossible to obtain the result of this law in man, because it would necessitate the crossing of persons of the same parentage.

Although we are unable to work out the mendelian ratio in man, there are certain deductions that can be made from the families that have been reported. Davenport[1] shows the pedigrees of three families with anomalies of the iris, and concludes that no woman with the defect should have children, since all sons will show the defect; and, should an affected man marry a normal woman, he will transmit the defect to all or to half his children. He believes that the defect is due to an inhibitor of development and that the affected male is either simplex or duplex in this inhibitor and the affected female typically duplex. In some of the families that he illustrates, affected children have sprung from unaffected parents in one of whom, of course, the defect was recessive or dormant.

In the pedigree here reported, all of the affected persons have an affected parent. In the fourth generation the character disappeared in one family and has not reappeared in the children of this family. One daughter of the fourth generation has been married twice and has transmitted the defect to a child of each union. One of the children is in a school for the blind, and two from the other family are as yet attending public school but with little result.

The facial aspect is characteristic, because of the efforts to shut out light. The palpebral fissure is voluntarily narrowed, the chin held down on the chest; photophobia and nystagmus are marked. There are no corneal opacities in the children, but these are present in all the adults.

Two babies have been born since these families have been under my observation both with aniridia, which was early detected at birth.

It would seem, as Nettleship found in his families with night blindness, that long continued marriage with the normal person produces no amelioration in the defect.

400 Portsmouth Building.

* From the University of Kansas School of Medicine.

1. Davenport: Heredity in Relation to Eugenics.

Special Article

GLANDULAR THERAPY

THE SURGICAL APPLICATION OF EPINEPHRIN *

EDWARD P. RICHARDSON, M.D.
BOSTON

The use of epinephrin in surgery depends on its local effect as a vasoconstrictor, and, after absorption, on its effects on the heart and circulation in general.

When epinephrin comes in contact with a limited area of the peripheral circulation as a result of local absorption or of injection into the tissues, it acts promptly as a vasoconstrictor. The action persists over a considerable but variable period of time, depending chiefly on the concentration of the drug, and the activity of the circulation through the area affected. Clinically, this action may be counted on for about one hour; in strong concentration it may act considerably longer up to several hours. Constriction may be followed by vasodilation.

In surgery, local vasoconstriction may be produced by injection into the tissues directly, or by application to mucous, serous or wound surfaces. The action is not purely local; the possibility of a constitutional effect must be borne in mind. This vasoconstriction, with reduction of the amount of blood and rate of circulation, leads to uses of great importance. By local application, depletion of mucous membranes is readily secured, reducing congestion, and giving in operations, particularly in those on the nose and related sinuses, a wider access and better vision, as well as a relatively bloodless field. The rate of absorption of drugs into the general circulation is reduced over the area of vasoconstriction. This leads to prolongation and intensification of the effects of local anesthetics. In practice, these two effects are combined by the addition of epinephrin to solutions used in local and regional anesthesia. If applied to mucous surfaces, as in otolaryngology, the concentration of epinephrin may be relatively great; if injected into the tissues directly, the solution should be extremely dilute and the possibility of toxic effects

* This is the eighth of a series of articles prepared under the auspices of the Council on Pharmacy and Chemistry. When completed, the series will be published in pamphlet form.

borne in mind. In operations for exophthalmic goiter, no epinephrin should be used. Two things should be noted in connection with the use of epinephrin. On account of the ischemia of the tissues, small vessels may be overlooked which subsequently bleed; hemostasis should therefore be careful. In tissues with impaired circulation, vasoconstriction may lead to delayed healing, or even to necrosis.

Epinephrin may be used to control hemorrhage, particularly from mucous surfaces when no vessel of considerable size is eroded. It is most effective in mucous cavities that can be packed with gauze soaked with it in solution. Hemorrhage may recur from subsequent vasodilatation, but opportunity for clotting in small vessels is given. In the wounds of general surgery, its use is less satisfactory. The normal reaction of the tissues to infection and in repair is interfered with while vasoconstriction lasts.

Epinephrin has further been suggested as a means of controlling inaccessible internal hemorrhage through its predominant vasocontrictor action after absorption. However, the effect of constriction is counterbalanced by the rise in blood pressure, so that the total effect is uncertain and may be harmful. Its use for this purpose cannot be recommended.

Epinephrin, when introduced into the circulation in therapeutic doses, causes a rise of blood pressure and cardiac stimulation. While this action would suggest its use in surgical conditions associated with low blood pressure, experience has shown that even under these conditions its value is limited. To secure a definite effect, the drug is best given intravenously. Under these conditions, its action is very brief, the total rise of blood pressure lasting only a few minutes.

In traumatic shock, while a rise of blood pressure may be secured, it leads to no permanent benefit. Cannon [1] states that the rise of blood pressure results from increase of resistance in the tips of the arterial tree, with accumulation of blood in the arteries. The accumulation may lead to a temporarily better flow through the heart muscle and cerebral vessels. The increased arterial pressure gives a wholly spurious impression of the state of the circulation. Damming the blood back in the arterial portion of the circulation obviously does not increase the volume flow through the capillaries, where it is needed. In the British and American armies, the use of vasoconstrictor drugs, such as pituitary extract and epinephrin, practically disappeared during the recent war.

In low blood pressure due to acute hemorrhage, or to hemorrhage and shock, the use of epinephrin is even less advisable. Here the indication is to restore blood volume by the most effective measures available, preferably by transfusion.

Since the effect of epinephrin in low blood pressure due to shock and hemorrhage is not of permanent benefit, and may be harmful if excessive doses are used, measures to prolong its action, as by continuous instillation in saline solution, are not advisable.

In desperate emergencies, while waiting for more effective measures likely to be quickly available, epinephrin may be of value. In collapse, with sudden fall of blood pressure, such as that occasionally produced by spinal anesthesia, the intravenous use of epinephrin may be a life-saving measure.

The use of epinephrin in resuscitation of the arrested human heart by means of intracardiac injection has recently been advocated. This measure has some justification in the cardiac stimulative action of epinephrin and in the resuscitation of experimental animals by its injection into the pericardial sac or carotid artery combined with cardiac massage. In applying it to the human being, certain things should be noted. If the circulation is still active, the full effect of epinephrin may be obtained by intravenous injection, and the risk of cardiac puncture is unnecessary. If excessive dosage is used, epinephrin itself causes dilatation and permanent arrest of the heart. Intracardiac injection can lead to permanent benefit only when the cardiac arrest results from a cause that leaves the rest of the organism essentially intact. Artificial respiration and cardiac massage should be employed as well as the injection. This method cannot be considered as yet worked out in its details, and carries possibilities of harm through injudicious use and the employment of excessive doses of epinephrin.

1. Traumatic Shock, Cannon, W. B.: New York, D. Appleton & Co., 1923.

EPINEPHRIN AND SUPRARENAL GLAND IN INTERNAL MEDICINE

HENRY A. CHRISTIAN, M.D.
BOSTON

In considering the therapeutic action of glands of internal secretion, one must distinguish between the action of gland preparations in a replacement sense, in which the preparation supplies a deficiency due to a disturbance of the function of the same gland, and the pharmacologic action of gland preparations on a person who has no evidence of disturbed function of the gland from which the preparation was obtained. An extreme example of the latter occurs in connection with the thyroid. Iodin may be obtained from the thyroid; this iodin would have the same therapeutic action as iodin in the same form from any other source, and no one would regard this as any more than the usual pharmacologic or therapeutic effect of the substance instead of thinking of it as in any way related to the internal secretion of the thyroid gland. In this way one must consider the therapeutic effect of epinephrin. Epinephrin is a definite substance, prepared from the suprarenal gland, which has a characteristic pharmacologic action on animals and patients that possess entirely normal suprarenal glands. This I will speak of as the direct action of epinephrin, in contrast to the replacement action of epinephrin and suprarenal gland in patients in whom there is believed to exist a deficiency of secretion from the suprarenal glands.

DIRECT ACTION OF EPINEPHRIN IN INTERNAL MEDICINE

In asthma, epinephrin has a striking effect in relieving the spasmodic dyspnea of the disease. The relief obtained is not permanent, but the same effect may be obtained time after time. Epinephrin does not tend to lose its effect, and nothing analogous to a drug habit results from its continued use. In an occasional patient, unpleasant symptoms result, but this is rare in the patient with asthma. Epinephrin in asthma is not effective by mouth. It should be given subcutaneously in doses of from 0.5 to 1 c.c. of the 1:1,000 solution. Occasionally, better results are obtained with larger doses, but a dose larger than 2 c.c. of the 1:1,000 solution should not be given. The dose may be repeated in fifteen minutes if required, but relief, if obtained,

ordinarily lasts much longer than fifteen minutes. There seems to be almost no limit to the number of repeated doses that may be given in this way with safety.

In urticaria, angioneurotic edema and serum sickness, epinephrin, given in the way just described, produces, as a rule, striking amelioration of the symptoms. On their recurrence, epinephrin should be repeated.

A subcutaneous injection of from 0.5 to 1 c.c. of a 1:1,000 solution of epinephrin, or an intravenous injection of 0.25 c.c., may be of great value in cardiac collapse. In some cases it initiates contractions in a heart that has ceased to beat; in such a case, 0.25 c.c. of a 1:1,000 solution should be injected directly into the ventricle.

Epinephrin has been recommended for the prevention of some of the toxic effects (so-called nitroid crises) of arsphenamin injections. It is given in subcutaneous doses of 0.5 c.c. of a 1:1,000 solution shortly before the arsphenamin injection. It may be used in subcutaneous doses of from 0.5 to 1 c.c. of a 1:1,000 solution to counteract the symptoms of hypoglycemia produced in a diabetic patient by insulin. Its other suggested uses in internal medicine are of doubtful value.

REPLACEMENT USE OF EPINEPHRIN AND SUPRARENAL GLAND IN INTERNAL MEDICINE

Addison's disease is the one condition in which there is a definite suprarenal deficiency. In an occasional case, dried suprarenal gland substance (Suprarenalum Siccum, U. S. P.), produces improvement; a rare case has been claimed to be cured; in most cases the effect is almost nil. The dose which has been used by various observers ranges from 0.1 to 1 gm., or even 2 gm., by mouth, three times a day. With this some have combined epinephrin, from 0.5 to 1 c.c. of a 1:1,000 solution, given subcutaneously and by rectum, the latter in salt solution. Epinephrin, on the whole, seems less effective in Addison's disease than whole gland substance. Reported results from gland therapy in Addison's disease merit much skepticism with regard to anything more than temporary improvement in symptoms.

In addition to Addison's disease there are a number of conditions of lowered blood pressure, asthenia and circulation weakness, sometimes associated with nausea and vomiting, which are regarded by some as the result of hypofunction of the suprarenals. In these conditions, excellent results are reported from giving gland substance or epinephrin. Proof of a real relation to suprarenal hypofunction is lacking in most of these conditions, and an effect from suprarenal therapy is doubtful. In fact, in such form as at present available, the replacement action of suprarenal gland merits much therapeutic skepticism.

EFFECTS OF TOO MUCH EPINEPHRIN AND SUPRARENAL GLAND

It is to be remembered that, in excess, epinephrin causes sweating, palpitation, muscular tremors, weakness and occasionally collapse. Some persons are sensitive to very small doses of this substance. Whole gland in too large doses has been reported to produce physical and mental weakness, irritability, insomnia, intestinal disturbance and cramps.

TRANSPLANTS OF SUPRARENAL GLAND

With regard to transplants of the suprarenal gland, there have been no reports to justify its use, and there are fatalities to warn against its trial.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

LACTO-DEXTRIN.—A mixture composed of lactose, 73 per cent.; dextrin, 25 per cent.; and desiccated lemon juice 2 per cent.

Actions and Uses.—The administration of lacto-dextrin is proposed as a means of promoting the growth of the normally present aciduric organisms B. acidophilus and B. bifidus in the alimentary tract so as to make them the predominating organisms. It is claimed that this increased growth of acidophile organisms prevents the undue development of putrefactive bacteria and their products. It is claimed that this change in the character of the intestinal flora brings about increased intestinal activity and that this in turn prevents or ameliorates certain conditions commonly ascribed to putrefactive products in the colon.

Dosage.—From 50 to 120 Gm. (2 to 4 ounces) dissolved in four times its bulk of hot water, three times a day preferably half an hour or an hour before meals. The nutritive value of 500 Gm. of lacto-dextrin corresponds approximately to 1,900 calories.

Manufactured by the Battle Creek Food Company, Battle Creek, Mich. No U. S. patent. U. S. trademark 178,414.

PITUITARY EXTRACT-LILLY (OBSTETRICAL).—A slightly acid aqueous solution containing the water-soluble principle or principles of the fresh posterior lobe of the pituitary body of cattle. It is tested for oxytocic action on the isolated uterus of the virgin guinea pig against a standard solution prepared from defatted, desiccated posterior lobe powder by the method of E. E. Swanson (*J. Lab. Clin. Med.*, February, 1924, p. 334) and adjusted so that its strength is equal to that of a 5 per cent. solution of the fresh posterior lobe of the pituitary gland.

Action and Uses.—See general article, Pituitary Gland, New and Nonofficial Remedies, 1924, p. 225.

Dosage.—From 0.2 to 1 Cc. (3 to 15 minims).

Manufactured by Eli Lilly & Co., Indianapolis, Ind. No U. S. patent or trademark.

Ampules Pituitary Extract-Lilly (Obstetrical), 0.5 Cc.
Ampules Pituitary Extract-Lilly (Obstetrical), 1 Cc.

PITUITARY EXTRACT-LILLY (SURGICAL). — A slightly acid aqueous solution containing the water-soluble principle or principles of the fresh posterior lobe of the pituitary body of cattle. It is tested for its pressor action on the blood pressure of mammals and for oxytocic action on the isolated uterus of the virgin guinea-pig by the methods of Hamilton and Rowe (*J. Lab. Clin. Med.*, November, 1916, p. 120) and E. E. Swanson (*J. Lab. Clin. Med.*, February, 1924, p. 334) against a standard solution prepared from defatted, desiccated posterior lobe powder and adjusted so that its strength is equivalent to that of a 10 per cent. solution of the fresh posterior portion of the pituitary gland.

Actions and Uses.—See general article, Pituitary Gland, New and Nonofficial Remedies, 1924, p. 225.

Dosage.—From 0.2 to 1 Cc. (3 to 15 minims).

Manufactured by Eli Lilly & Co., Indianapolis, Ind. No U. S. patent or trademark.

Ampules Pituitary Extract-Lilly (Surgical), 1 Cc.

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SATURDAY, NOVEMBER 15, 1924

THE SURGERY OF THE HEART

Some of the most dramatic chapters in the history of medicine deal with the development of surgery. "A good surgeon must have an eagle's eye, a lion's heart, a lady's hand." Thus runs the old English proverb, formulated in the days before anesthetics banished pain and antiseptics averted the horrors of wound infection. Today no large part of the body is destined to remain free from surgical approach. The abdomen, thorax and cranium have already been invaded by the trained surgeon with eminent success in the relief of a variety of maladies. Blood vessel and nerve surgery have been developed to a high degree of skill. Plastic transformations are being made in varied parts of the body. This progress has called not only for great resourcefulness of hand and mind but also for personal courage. The pioneer into uncharted places usually proceeds at his own peril only; he pays the penalty for failure with his own person. The surgical pioneer, however, literally takes the lives of others in his hand, and that is a sobering responsibility. Daring, under such circumstances, must be fortified with wisdom and stamina.

Little is the wonder, then, that many parts of the body remained untouched so long by the surgeon's hand. The heart is one of the organs that has rarely been subjected to direct intervention from without. The reasons for this have been well summarized by Lee.[1] He recalls that not only the hearts of the lower forms but even those of warm-blooded animals will withstand much manipulation within the body, and may be removed in toto and retain their activity for many hours or even days. Notwithstanding this, it has not been easy to overcome the feeling that the human heart must be left untouched. For many centuries its wounds were regarded as necessarily fatal, and it is only within a period of a few years that surgeons have come to realize that this vital organ is not outside their legitimate province. "The road to the heart," says a graphic writer, "is only 2 or 3 cm. in length in a direct line, but it has taken surgery nearly twenty-four hundred years to travel it." Up to the present time, the application of surgical procedures to cardiac conditions has been restricted almost entirely to the treatment of traumatic wounds of the heart, an undertaking in which few persons have ventured to participate. A recent writer has remarked that this is unfortunate, since there may exist cardiac conditions for which surgery may be the only effectual treatment; and since the dangers are chiefly those of technic, they should be surmountable. Every devotee of medicine ought therefore to become filled with enthusiastic admiration for the pioneer effort that has just been recorded from the Harvard Medical School in developing a method of partial valvulectomy in man for relief of mitral stenosis.[2]

The justification for this work lies in the circumstance that, to quote Sir Lauder Brunton, this malady is not only one of the most distressing forms of cardiac disease, but in its severe forms it resists all treatment by medicine. Preliminary tests on animals showed the possibility of penetrating the heart successfully for the enlargement of the mitral valve. A cleverly fashioned instrument—a cardiovalvulotome—was devised for the operation. After repeated trials in the experimental laboratory, the technic was applied to four cases of mitral stenosis in human beings, for which the prognosis was otherwise most unfavorable. The details of this outstanding attempt—the careful preparation for the surgical trials on man, the well reasoned procedures that were adopted, the critical analysis of the conditions that might affect the results, the frank presentation of the experiences of the surgeons—will rank among the really notable contributions to the progress of surgery. The results achieved augur well, we believe. The first patient is living and apparently improved one year after the operation. The other three patients survived the operation sufficiently long to exclude the probability that the new procedure per se was a factor in the subsequent fatalities. The Harvard surgeons Cutler, Levine and Beck modestly conclude that the proposal that certain cases of mitral stenosis may be relieved by surgery has not been contradicted by their experiences.

Cutler, Levine and Beck have faced frankly the dangers accompanying surgical intervention in cardiac conditions. They realized, to quote their own words, that the heart is a vital organ, relatively inaccessible, and its state of constant activity creates a condition that raises the technical consideration of any operative intervention to the level of prime importance. It contains, moreover, the maximal capacity for hemorrhage, that most terrifying accompaniment of surgery. Yet they have seemingly triumphed over the difficul-

1. Lee, F. S.: Scientific Features of Modern Medicine, New York, Columbia University Press, 1911, p. 143.

2. Cutler, E. C.; Levine, S. A., and Beck, C. S.: The Surgical Treatment of Mitral Stenosis: Experimental and Clinical Studies, Arch. Surg. 9: 689 (Nov.) 1924.

ties. In evaluating the factors that led to success, we should not overlook the directing part played by animal experimentation at each step. The perfection of surgical technic, the increasing proficiency and accumulated knowledge of surgeons, both in the treatment of wounds of the heart and in the field of pulmonary surgery, and the development of a reliable mechanical respiratory apparatus for administering the anesthetic were the chief elements in the development of a surgical method for the treatment of mitral stenosis. Every item was made possible first and foremost by trial on the laboratory animals. Let animal experimentation share in the gratitude that every ardent student of medicine and all clear thinking laymen must feel on the occasion of a fine accomplishment in the field of human welfare.

THE CARE OF THE VETERAN

In the World War Veterans' Act, passed by the Sixty-Eighth Congress, there is a section which indicates the scope of care to be given to former soldiers in United States armies. Like much other legislation, the particular section referred to permits of several interpretations and, indeed, its limitations are only such as the officers charged with the carrying out of the legislation may themselves wish to define. In order that the matter may be clear to physicians who must, by the very nature of things, take a special interest in the problem, the section is here quoted in full:

PUBLIC ACTS—No. 242—Sixty-Eighth Congress
World War Veterans' Act

(10) That all hospital facilities under the control and jurisdiction of the bureau shall be available for every honorably discharged veteran of the Spanish-American War, the Philippine Insurrection, the Boxer rebellion, or the World War suffering from neuropsychiatric or tubercular ailments and diseases, paralysis agitans, encephalitis lethargica or amoebic dysentery, or the loss of sight of both eyes, regardless whether such ailments or diseases are due to military service or otherwise, including traveling expenses as granted to those receiving compensation and hospitalization under this act. The director is further authorized, so far as he shall find that existing government facilities permit, to furnish hospitalization and necessary traveling expenses to veterans of any war, military occupation, or military expedition since 1897, not dishonorably discharged, without regard to the nature or origin of their disabilities: *Provided*, That preference to admission to any government hospital for hospitalization under the provisions of this subdivision shall be given to those veterans who are financially unable to pay for hospitalization and their necessary traveling expenses.

It is obvious to any one reading this section that it might work an unjust imposition on the medical profession. There are thousands of veterans of the various wars specifically mentioned in the act who are abundantly able to pay for medical service, and no doubt by far the largest number of them are perfectly willing to pay for whatever may be done for them. There are, on the other hand, many who would be willing to take full advantage of the provisions of the act, so far as it relates to the receiving of free medical and hospital care.

If the act be interpreted most liberally, it provides for free treatment and traveling expenses for any soldier, without regard to the nature or origin of his disability or to the length of his service, provided only that preference is given to those who are financially unable to pay. If, however, the act is carried out according to the manner in which such legislation should be enforced, from a proper sociologic and economic point of view, the government will provide just sufficient facilities to take care of those who are unable to pay, so that there will be little or no call on the service by those who are financially competent.

Exactly what will be the effect of this act is, therefore, hard to predict, since there has been no special use thus far for this section. At present, it covers only facilities in existing government hospitals, but it is quite possible under the act to expand facilities to an almost unlimited extent. Here is a situation which deserves the constant and watchful attention of all who are interested in the relations of the government to the care of the sick.

SYMPATHECTOMY FOR SPASTIC PARALYSIS

Among the surgical procedures recently proposed for the relief of various conditions, probably not one has provoked more interest than that brought forth for the alleviation of spastic paralysis. Ever since the discovery of the double innervation of voluntary muscle, and especially in the last twenty years, investigators have sought to determine the function of these sympathetic nerve branches and the phase of muscular activity they control. Using the common laboratory animals, and employing methods that have ranged from paralysis with such compounds as nicotin to extirpation of the ganglions and their rami in normal, spinal and decerebrate animals, the results obtained have varied. The discussion has busied itself with the effect of the removal of this sympathetic influence on the tonus of the muscles, and at the close of the laboratory phase of the subject, as many workers assert that there is a definite relation between this property of muscle and the influence of the sympathetics, as deny it.

In the last few years this problem may be said to have entered a second phase, when surgery turned its attention to the sympathetics under the leadership of Jonnesco and of Leriche. Assuming the presence of unmedullated fibers to each muscle to be definite evidence of some function, and further assuming that this function may have some relation to spastic paralysis, Royle,[1] with the aid of Hunter,[2] conducted a series of experiments, using goats, and from these concluded that the removal of the sympathetic trunk, or a number of its rami, abolishes plastic tone, does not interfere

1. Royle, N. D.: A New Operative Procedure in the Treatment of Spastic Paralysis and Its Experimental Basis, M. J. Australia 1:77 (Jan. 26) 1924; supp. 1:125 (March 15) 1924.
2. Hunter, J. I.: Postural Influence of the Sympathetic Innervation of Voluntary Muscle, M. J. Australia 1:86 (Jan. 26) 1924.

with the ability of the animal to control movements in the corresponding limb, and also causes a "depression of the reflex activity and a disturbance of the mechanism of maintaining the posture of the limb." Applying these results clinically, he operated in two cases of spastic hemiplegia, one involving a leg and the other involving an arm, removing the sympathetic connections to the first to fifth lumbar nerves in one, and the fifth to eighth cervical and first thoracic, with avulsion of the rami to the whole cervical plexus, in the other patient. The results in both are reported as immediate and marked, with a gradual decrease in the rigidity and concomitant increase in the patient's ability to control the extremity involved. Leriche and Wertheimer [3] have since repeated two such operations, and report results agreeing with Royle's.

In this country the operation has been performed numerous times, but the immediate results have not been uniform, and do not all concur with those mentioned. In this issue of THE JOURNAL appears the report of a meeting held under the auspices of the Institute of Medicine of Chicago, at which Drs. Kanavel, Pollock and Davis [4] of Chicago gave their experiences in an attempt to establish the experimental basis for sympathectomy in spastic paralysis. They announced also the results of operations performed on twelve patients, using not only the methods outlined by Professor Royle but also other technics especially worked out for the purpose. The experience, as will appear from the report, was distinctly disappointing. Neither the investigations on the animals nor the experimental operations on the patients were at all encouraging. The attempts at accurate measurement of muscle tone did not indicate that sympathectomy had any effect in modifying the spasticity. Patients were carefully studied, both by the usual clinical tests and also with the motion picture, and this intensive study failed to reveal that there had been any actual improvement in gait or in the ability to move paralyzed limbs. Apparently, the conclusion at this time must be that the investigations of Royle and Hunter have yielded information of great interest to both physiologists and surgeons, but that, so far as any clinical demonstration of the value of the method in spastic paralysis is concerned, the evidence must be much more extensive and much stronger before it may be considered as in any way a warrant for general application of this operative method in the treatment of patients suffering with such paralyses. The more extensive experience with the method becomes, even in the hands of its most ardent proponents, the more limited appear to be the indications. This is particularly the case since the physiologists have not concurred in the belief that the experimental basis for the operation is established.

3. Leriche, R., and Wertheimer, P.: Sur la découverte chirurgicale des rameaux communicants, Lyon chir. **21**: 486, footnote, 1924.

4. Kanavel, A. B.; Pollock, L. J., and Davis, L. E.: Experimental and Clinical Experiences with Sympathectomy in Spastic Paralysis, abstr. this issue, p. 1615.

HUMAN INHERITANCE

In an inspiring lecture recently delivered at the University of Pittsburgh, Professor Morgan [1] of Columbia University emphasized anew the growing justification that exists today for applying to human variations some, at least, of the same laws of inheritance that have at length been found common to animals and plants, both wild and domesticated. Many characters shown by living organisms have had an ancient origin and are transmitted by the familiar processes of heredity. They may become distributed widely among numerous varieties through the agency of crossed breeding. Today it is recognized further, however, that there are characters which arise as "sudden and random changes in a localized region of the germ material by mutation, or, as we say, by a change in a gene." These mutant types have attracted particular interest among modern geneticists. Most mutant types are regarded by them as failures, though a few manage to persist. As Morgan reminds us, when it is recalled that for millions of years those individuals that are best adapted to their environment have produced the next generation, it is to be expected that the wild type has become as nearly fitted to the world in which it lives as is possible for this particular organism. Or, to put the matter in another way, Morgan adds, most of the possible variations have already been tried out and rejected as inefficient. The result is that most organisms are wonderfully adjusted to the world in which they live. This is doubtless true of human beings as well as of other animals and of plants.

With the existence of true mutants frankly admitted, it no longer becomes necessary to seek some extraneous cause in explanation of certain deviations from the expected types of persons. This brings us face to face with the long debated problem of the inheritance of acquired characters. Recently, attention has been directed to biologic experiments in which insults to the parental organism through chemical or physical agencies, such as alcohol or radium, have resulted in defects in the offspring observed beyond the first generation, although the latter were not directly exposed to the harm. The most plausible explanation of the apparent inheritance of an artificially induced damage is that when the injured germ cells produce a new generation, the individuals are defective because the same organs whose normal development was most disturbed are the organs that are most easily affected by any alteration in the course of development. They are, as Morgan expresses it, the weakest or most delicately balanced phases of development, and therefore the first to show the effect of any departure from the normal course of events.

Although Morgan is unwilling to accept the theory of the inheritance of acquired characters in the strict

1. Morgan, T. H.: Human Inheritance, Am. Naturalist **58**: 385 (Sept.-Oct.) 1924.

sense of the word, he has taken pains to emphasize another factor that plays an important part in human life and progress. There is a social and economic inheritance, an acquired experience, as well as the products of experience (property, machinery, customs, myths) that are transmitted from one generation to the next and are inherited by the latter. In this respect, man has reversed the old order of nature. He may not inherit the bodily or the mental characters that his parents have acquired through training, but in another way he inherits the results of their experience. Owing to his possession of a wonderful memory, of his acquisition of speech, and then of the art of writing and printing, and last, but not least, his power of learning which his prolonged childhood enables him to endure, accompanied by an overlapping of generations, he is able, Morgan continues, to endow each successive generation with the acquirements of the preceding ones. Strangely enough, social and biologic evolution may at times come into apparent conflict; but, in the biologic sense, inheritance means something different from what is implied by social inheritance. Perhaps, as Morgan has said, our familiarity with the process of social inheritance is responsible, in part, for a widespread inclination to accept uncritically every claim that is advanced as furnishing evidence that bodily and mental changes also are transmitted.

Current Comment

ARCHIVES OF OTOLARYNGOLOGY

On advertising pages 6 and 7 of this issue of THE JOURNAL appears an announcement of the new periodical to be issued by the American Medical Association Press—the *Archives of Otolaryngology*. The publication of these special journals by the American Medical Association constitutes one of its most important contributions to the advancement of scientific medicine in this country. It is generally recognized that the progress of knowledge in any field of medical science today is dependent as much as anything else on the wide dissemination of information as to new problems that are being investigated, and the results that are being achieved. The new periodical, as indicated in the announcement, will be devoted to the publication not only of original contributions on diseases of the ear, nose and throat, but also of a monthly review detailing complete progress in some single field. It will contain abstracts of domestic and foreign literature and the reports of special societies dealing with otolaryngology. The Association is already publishing a notable list of special journals in internal medicine, nervous and mental diseases, dermatology and syphilology, surgery, and the diseases of children. To this outstanding list, the *Archives of Otolaryngology* will be a welcomed addition. It is hoped that members of the Association will give it the same sincere support that has been accorded the other special publications that have been mentioned.

A NEW TYPE OF ACIDOSIS IN DIABETES

For many years the only type of acidosis recognized by physicians was that due to the acetone bodies and most commonly found in diabetes mellitus. When certain investigators began to speak of acidosis in nephritis produced by acids other than oxybutyric and diacetic, there was much skepticism; but now it is well established that acidosis in certain diseases may be due to acids other than beta-oxybutyric and diacetic. The recent investigations of Lundin[1] and of Modern[2] at the Physiatric Institute have shed new light on the whole subject of acidosis, and particularly on diabetic acidosis. These observers have shown that when diabetic patients showing diacetic acid and acetone are fed with intarvin—the synthetic odd carbon atom fat—the diacetic acid and acetone disappear from the urine. Their place, however, is taken by other acids—probably lactic acid and pyruvic acid—which are derived from the intarvin. The use of intarvin in diabetic acidosis, they believe, merely substitutes an odd carbon fat acidosis for the usual or even carbon fat acidosis. These findings of Lundin and of Modern probably have a direct bearing on the observations that have been made from time to time by certain investigators and discussed recently by Bock, Field and Adair.[3] The latter observers describe a patient suffering from diabetic coma in whom a low carbon dioxid tension in the blood persisted in spite of large doses of insulin and the disappearance of large quantities of ketones. They suggest the possible explanation that some acids other than those of the ketone group are responsible for the persistence of the acidosis in such cases. Their observations also suggest that the administration of sodium bicarbonate may be of great value in neutralizing these acids. These are not merely academic questions, but problems that confront every physician who treats diabetes. On their solution will depend the decision as to whether alkalis shall be given to patients with diabetes.

URIC ACID EXCRETION

For some years the theory of the indestructibility of uric acid in the human organism has held almost undisputed sway. As was pointed out recently,[4] uric acid has come to be regarded as an end-product of purin metabolism in the human species, although it is well known that in most other mammals uricolysis takes place, resulting in the formation of allantoin and perhaps other degradation products. So long as uric acid is believed to represent a final stage in certain of the body's chemical transformations, obviously it must either be eliminated as such or remain deposited in the fluids, organs and tissues of the body. As possible paths of elimination, the intestine and the skin have received consideration, but the evidence has been essentially negative in character. Consequently, the kidneys

1. Lundin, Harry: Catabolism of Odd in Comparison with Even Carbon Fatty Acids in Man, J. Metabol. Res. **4**: 151 (July-Aug.) 1923.
2. Modern, F. S.: Clinical Observations with Odd-Carbon-Atom Fat (Intarvin), J. Metabol. Res. **4**: 177 (July-Aug.) 1923.
3. Bock, A. V.; Field, H., Jr., and Adair, G. S.: The Acid-Base Equilibrium in Diabetic Coma, Being a Study of Five Cases Treated with Insulin, J. Metabol. Res. **4**: 27 (July-Aug.) 1923.
4. The Uric Acid Problem, editorial, J. A. M. A. **83**: 1246 (Oct. 18) 1924.

have acquired the foremost interest in connection with the problem of how the body rids itself of an excess of uric acid. There can be no doubt that under ordinary conditions of health much of it is carried away in the urine. From experiments that Wiechowski conducted in 1909 by injecting uric acid subcutaneously in man, it appeared that the substance reappeared almost quantitatively in the urine—a fact that seemed quite in harmony with the added demonstration that human tissue extracts .do not destroy it in vitro. Numerous more recent studies, however, in which uric acid has been introduced in solution directly into the circulation have shown a failure of recovery of the assumed end-product.[5] The latest of these, by Koehler[6] of the University of Wisconsin, like the experiments of Folin and his associates, indicate on the basis of many tests on man that only about a half of the uric acid injected intravenously can be recovered in the urine. The amount recovered varies with different persons. On such an experimental basis it is no longer easy to avoid the conclusion that destruction of uric acid does normally occur in the human organism. Various investigators have observed of late that high values for uric acid in the blood may be independent of demonstrable kidney defects, and in nephritis there may be a high retention of other nitrogenous constituents of the blood with substantially normal uric acid levels.[7] If it is assumed, as now seems justifiable, that uric acid in the organism is subject to both destruction and excretion, and that the speed of each of these functions may vary independently, the lack of parallelism between the blood and urinary findings can more readily be understood. The clinician will do well for the present to avoid too much speculation regarding the significance of so-called hyperuricacidemia.

CHIROPRACTIC AND INFANTILE PARALYSIS

Comes to the editorial desk a copy of the De Kalb (Ill.) *Daily Chronicle* for Oct. 25, 1924, containing a brief article, presumably an advertisement, although not so designated, on infantile paralysis. According to the information disseminated by the *Chronicle*, "infantile paralysis is the direct result of nerve impingement somewhere along the contour of the spinal column." Then follows a description of the symptoms that may develop with infantile paralysis, leading up to the suggestion:

> Should you notice any of these symptoms coming upon your child you should converse with a chiropractor immediately. He will adjust the segments of the spine and restore normal nerve supply to the part of the cord affected and reduce the inflammation before any damage has been done.

Presumably, the editor of the De Kalb *Daily Chronicle* would feel aggrieved if, in printing this stuff, he were accused of showing an almost criminal disregard of the public health. What would be thought of a newspaper that would urge parents who had children suffering from diphtheria, scarlet fever, smallpox or some equally virulent disease to take the child to a voodoo doctor or to pronounce incantations over the afflicted little one or to rely on the healing power of a horse-chestnut or a magic ring? Yet none of these suggestions is more iniquitous than that which would lead the public to believe that infantile paralysis is due to the impingement of spinal nerves and can be cured by chiropractic "adjustment."

5. Bürger, M.: Arch. f. exper. Path. u. Pharmakol. **87**: 392, 1920. Griesbach, W.: Biochem. Ztschr. **101**: 172, 1920. Thanhauser, S. J., and Weinschenck, M.: Deutsch. Arch. f. klin. Med. **139**: 100, 1922. Folin, O.; Berglund, H., and Derick, C.: J. Biol. Chem. **60**: 361, 1924.
6. Koehler, A. E.: Uric Acid Excretion, J. Biol. Chem. **60**: 721, 1924.
7. Folin, Otto: The Harvey Lectures, **15**: 109, 1919-20. Feinblatt, H. M.: Uricacidemia, Arch. Int. Med. **31**: 758 (May) 1923.

PNEUMONIC PLAGUE

Up to November 12, there had occurred in the Mexican quarter in Los Angeles thirty-six cases of plague, all traceable to the same origin and to the same district. The evidence is, according to the health authorities investigating the epidemic, that the first case was of the bubonic type, and that all subsequent cases have been pneumonic, except two. In the thirty-six cases thus far noted, there have been thirty-three deaths, and the authorities do not anticipate many more pneumonic cases. The immediate, drastic and well warranted action taken by the health authorities seems to have been sufficient to confine the infection definitely to the quarter in which it originated. Further and extensive studies will now be made to determine to just what extent rat infection prevails, and its bearing on the cases that have already developed.

Association News

THE ATLANTIC CITY SESSION

Advisory Committee for Scientific Exhibit

The Board of Trustees has appointed the following as members of the Advisory Committee of the Scientific Exhibit: Drs. George Blumer, New Haven, Conn.; Walter B. Cannon, Boston; George Dock, Pasadena, Calif.; Ludvig Hektoen, Chicago; Urban Maes, New Orleans, and Ralph H. Major, Kansas City, Mo. Dr. J. Shelton Horsley, Richmond, Va., has been made ex officio a member of the committee by virtue of his chairmanship of the Council on Scientific Assembly.

The Committee on Scientific Exhibit of the Board of Trustees announces that both the Scientific Exhibit and the Motion Picture Theater will be located on the Atlantic City Steel Pier, adjacent to the registration bureau and commercial exhibits. As nearly as possible, the general arrangement of the booths will follow the plan of the Chicago Session. The usual circular letter and application blanks for the Scientific Exhibit, 1925, will be sent out about the first of next year. Any who desire to receive these should send their names and addresses to Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago, Illinois.

Papers for Section on Orthopedic Surgery

The meeting of the Association will be held in Atlantic City, May 25-29, 1925. Any member wishing to present a paper before the Section on Orthopedic Surgery is requested to send the title and a short abstract to the secretary as soon as possible.

All papers put on the program must be accepted and approved by the Executive Committee. No request will be considered unless accompanied by an abstract.

ARCHER O'REILLY, M.D., Secretary,
3534 Washington Boulevard, St. Louis.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Hospital News.—Construction will start within a month on the new $500,000 addition to the Methodist Hospital, Los Angeles, comprising a five-story addition to the hospital and the new nurses' home.——Work has been started on a $100,000 addition to the Burbank Hospital, Burbank.

Banquet to First Woman Graduate.—A banquet was given, October 11, to Dr. Lucy M. F. Wanzer, San Francisco, the first woman admitted to membership in the San Francisco County Medical Society, it is reported, and the first woman to be graduated from the California School of Medicine, in honor of her eighty-third birthday. Dr. Wanzer was one of the founders of the Children's Hospital.

Rejuvenator Forfeits Bond.—Dr. Francis Eugene Elmer, whose trial on a charge of violating the state medical practice act was to have been in September, has forfeited bail of $5,000. He is a fugitive from justice, it is reported. Elmer conducted an extensive campaign in San Francisco last winter, it is reported, in which he claimed to be able to restore youth by means of transplanting goat glands. Arrested in March, his trial was postponed until September 15, at which time he failed to appear.

State Board Election.—At the meeting of the state board of medical examiners in October, the following officers were reelected: president, Dr. Percy T. Phillips, Santa Cruz; vice president, Dr. Harry V. Brown, Glendale; secretary, Dr. Charles B. Pinkham, San Francisco. Sixty applicants for written examination were admitted at this meeting, of whom five were midwives. The board will meet in 1925 at Los Angeles, February 9-12; San Francisco, July 6-9, and Sacramento, October 19-22.

Chinese Herb Doctors Not Licensed.—Reports have come to the state board of medical examiners that various herbalists in California are in some instances engaged in the "abortion business," and that in other instances the stores of Chinese herbalists are apparently conducted as a blind for the sale and distribution of narcotics. In reply to an inquiry, the secretary of the board said: "We do not know of a single instance in which one of the so-called Chinese herb doctors, who advertise extensively in various sections of California, has a license entitling him to practice in this state. So far as our information goes, none of these Chinese herb doctors has any particular training. . . . It would seem apparent in some localities that underground influence makes it impossible to convict Chinese herbalists of violation of the laws of this state."

COLORADO

Personal.—Dr. Samuel Swezey has resigned as medical director of the National Jewish Hospital for Consumptives, Denver, and is now with the Jewish Consumptive Relief Association at Duarte, Calif.

CONNECTICUT

An Institute for Midwives.—An institute for midwives was recently attempted in New Haven in an effort to raise the standard of midwives. Planned at first to limit the institute to New Haven midwives, as plans developed it was decided to invite all licensed midwives of the state. According to the New Haven Department of Health, Grace Hospital, opened its doors for the institute and arranged a trip of inspection through the hospital. The state department of health and the New Haven Health Department gave a two day program of lectures, demonstrations, motion pictures, and actual attendance on deliveries in the hospital. Of the 114 licensed midwives in the state, forty-nine were present. At the close of the institute, steps were taken by the midwives to form a state association with the object of elevating their standards and of putting the unlicensed midwife out of business.

DISTRICT OF COLUMBIA

Dr. Wiley Honored.—About 160 members of the Association of Official Agricultural Chemists, government officials and scientists attended a dinner, October 18, in Washington, in honor of the eightieth birthday of Dr. Harvey W. Wiley. A bronze medallion bearing his profile and an appropriate inscription was presented to Dr. Wiley. Replicas may be obtained from W. W. Skinner, assistant chief, Bureau of Chemistry, Washington, for $5.

ILLINOIS

Hospital News.—The Oak Park Hospital, Oak Park, has obtained a loan of $100,000 to complete its nurses' home.——It is reported that a $75,000 hospital building will be erected at Libertyville.

Society News.—At the seventy-eighth annual meeting of the Aesculapian Society of Wabash Valley, Paris, Dr. Nicholas C. Iknayan, Charleston, was elected president; Dr. Henry F. Becker, Danville, vice president, and Dr. Theodore N. Rafferty, Robinson, secretary.

Increase in Diphtheria.—According to the state department of health, the number of cases of diphtheria in Illinois has risen from an average of sixty-five a week in July to an average of 125 a week at this time. Four hundred children in the state have died of diphtheria this year.

Chicago

Chicago Council of Medical Women.—At the November 25 meeting of the Chicago Council of Medical Women, at 40 East Erie Street, the studies of hemorrhage will be continued, and Dr. Emma Martin, Peking, China, will talk on obstetric practice in China.

Society News.—Dr. John I. Hunter, professor of anatomy, University of Sydney, Sydney, Australia, lectured under the joint auspices of the department of anatomy, University of Chicago, and the Institute of Medicine of Chicago, in the Harper Library, November 10, on "The Anatomy and Physiology of the Sympathetic Nerve Supply of Striated Muscle."

Illegal Practitioner Sentenced.—Peter J. Sophonski, who was arrested, October 24, on a charge of practicing medicine without a license, was sentenced by Judge Gilster to serve one year in the house of correction and to pay a fine of $100. The inspector for the state department of registration and education said, it is reported, that the charge was based on the death of an infant last June after Sophonski had prescribed.

Diagnostic Institute Contemplated.—A corporation calling itself the Physicians and Surgeons Institution of Chicago is contemplating the organization of a diagnostic institute, including the erection of a large building with hospital beds and complete laboratory equipment. The facilities, it is announced, are to be placed at the disposal of all qualified physicians and surgeons. A permanent staff of consulting specialists also is to be available for advice in special cases. The temporary organization includes Drs. Carl Beck, chairman; Edward H. Ochsner, secretary; Bruce King, counselor, and Mr. George Walters, director.

Personal.—Dr. Wilson R. Abbott, for three years medical director of U. S. Veterans' Bureau Hospital No. 55, Fort Bayard, N. M., has resigned and has returned to Chicago to resume practice in tuberculosis.——Dr. Clarence L. Wheaton delivered the annual address before the Michigan Trudeau Society at the University of Michigan, October 24.——Dr. Karl K. Koessler, associate professor of experimental medicine, University of Chicago, addressed a joint meeting of the Marathon County Medical Society and the Ninth Councilor District Medical Society at Wausau, Wis., November 9, on "The Present Status of Vaccine, Serum and Protein Therapy."

INDIANA

Physician Bound Over to Grand Jury.—Dr. Donald F. MacGregor, Indianapolis, was bound over to the federal grand jury, it is reported, October 29, on a charge of violating the Harrison Narcotic Law.

Head of New Sanatorium Selected.—The board of trustees has selected Dr. James O. Parramore, Rochester, N. Y., as head of the new $500,000 Lake County Tuberculosis Sanatorium at Hammond, it is reported. The sanatorium will accommodate 300 patients and be ready for occupancy during the winter.

The Indianapolis Session.—According to the *Journal of the Indiana State Medical Association*, the house of delegates at the recent session of the state medical association approved the work done by the bureau of publicity of the association and provided for continuing that work with an increased

appropriation. The house of delegates also approved the council's recommendation that the bureau of publicity, cooperating with the advisory committee of the council, employ such help as is required to coordinate the activities of the general secretary's office with those of the bureau of publicity, and endorsed the action of the American Medical Association (1) in trying to secure a reduction of taxation of physicians under the Harrison Narcotic Law, (2) in seeking relief from the ruling of the commissioner of internal revenue, which prohibits a deduction from the income tax return of the expenses of attending medical meetings and doing postgraduate work, (3) in favoring legislation on the labeling of lye and other caustic substances, (4) in abandoning the plan for the reorganization of the federal health activities and (5) in seeking legislation controlling the sale of harmful substances in cosmetics and wearing apparel. The next meeting of the association will be at Marion.

LOUISIANA

Dr. Musser Appointed Professor of Medicine.—Dr. John H. Musser, Jr., assistant professor of medicine at the University of Pennsylvania School of Medicine, Philadelphia, has been appointed professor and head of the department of medicine at Tulane University School of Medicine, New Orleans, to succeed Dr. George S. Bel, resigned.

Physician Arrested.—Dr. Katherine B. Woodward, Monroe, who, it is reported, was indicted by the last federal grand jury on a charge of violating the Harrison Narcotic Law, was arrested by Deputy U. S. Marshal Geringher at Monroe, October 15. Following arraignment before a U. S. commissioner, Dr. Woodward was released on a bond of $500.

MARYLAND

Veteran Practitioner Honored.—The Cecil County Medical Society gave a complimentary dinner, October 28, at Elkton, in honor of Dr. George M. Stump, Perryville, who for more than fifty years has practiced medicine in Perryville and adjacent territory.

Children's Clinics.—Child health conferences were held at the nine county health centers during the week beginning October 20, under the direction of the bureau of child hygiene, state department of health. A deputy health officer was in charge of each conference. Children under 7 years of age were examined, and those needing treatment were referred to family physicians with a report from the health officer.

Personal.—Dr. Emery R. Hayhurst, professor of hygiene, Ohio State University, Columbus, delivered the DeLamar lecture at the Johns Hopkins School of Hygiene and Public Health, November 3, on "The Occupational Aspects of Common Disabilities." —— Prof. Thorvald Madsen, director of the state serum institute, Copenhagen, Denmark, spoke on "Standardization of Antibodies" at a joint meeting of the Medical Society of the Johns Hopkins Hospital and the Society of Hygiene of the Johns Hopkins University, November 3.

Home Coming Day.—Eudowood Sanatorium celebrated its twelfth annual home-coming day, October 30, when more than 400 visitors and former patients attended a reception at Towson. The object of these celebrations is to assist in the follow-up service of the patients. Each patient returning is interviewed by the superintendent, Dr. William A. Bridges. In addition to the reception, a bronze tablet was unveiled in honor of Miss Mary Eliza Reynolds, a charter member of the board of directors. Dr. Henry Barton Jacobs, president of the board, presided at the exercises.

MICHIGAN

Physician Sentenced.—Dr. James L. Passmore, Detroit, was sentenced in the U. S. District Court, October 10, to fifteen months in the federal penitentiary at Leavenworth, Kan., for violation of the Harrison Narcotic Law, it is reported.

Society News.—Dr. Aldred S. Warthin, professor of pathology, University of Michigan Medical School, Ann Arbor, will address the Wayne County Medical Society at Detroit, November 17, on "The Constitutional Background of Exophthalmic Goiter, Toxic Goiter and Toxic Adenoma."

University News.—Dr. William H. Stokes has been promoted from assistant instructor in ophthalmology, Dr. Ralph O. Rychener to assistant instructor in ophthalmology, University of Michigan Medical School, Ann Arbor, and Albert G. Young, Ph.D., has been appointed instructor in the department of pharmacology.

MINNESOTA

A State Medical Library.—During the summer the medical books at the University of Minnesota were transferred to the new university library building. The medical library has been fused with the biology and dentistry libraries to form a department of about 50,000 volumes. *Minnesota Medicine* says that no provision has been made for the loan of these books to physicians throughout the state and that perhaps 50 per cent. of the physicians are without the use of a first-class library. Attention is called to the New York State medical library at Albany which has been maintained for years and to the medical branch of the Iowa State library, established three years ago, and to the circulating medical libraries of the Medical Society of the County of Kings in Brooklyn and that of the College of Physicians and Surgeons in Philadelphia. Minnesota maintains a library of about 90,000 volumes for the law profession and the editor believes it is time for the state to establish a state library for physicians.

NEW JERSEY

Chiropractor Loses Six Cent Verdict.—The Court of Errors and Appeals, Trenton, October 30, set aside an award of 6 cents obtained in the Essex County Court by a chiropractor who sued Dr. William A. Tansey for libel, it is reported. The chiropractor mailed chiropractic advertising material to Dr. Tansey, who, according to reports, returned the letter, unopened, to the postoffice, with a notation on the envelop that the sender was a faker and quack.

Communities Adopting Child Hygiene.—Two hundred and twenty-six communities of the state have adopted the child hygiene program of the state department of health, the last one to do so being the borough of Fairview. The towns of Closter, Demarest, Cresskill, Norwood and Northvale, Bergen County, also the borough and township of Princeton, have assumed full responsibility for the salaries and expenses of teachers of child hygiene in those communities. Of the ninety nurses supervised by the bureau of child hygiene of the state department of health, the salaries and expenses of sixty-three have been assumed by the local departments of health and education.

NEW MEXICO

Outbreak of Tularemia.—With an outbreak of tularemia among rabbits in New Mexico, there have been ten cases in human beings and seven other suspicious cases reported. The investigation by the U. S. Public Health Service is still under way.

NEW YORK

Veteran Practitioner Honored.—The Dunkirk and Fredonia Medical Society gave a luncheon, October 29, at the Country Club in honor of Dr. George E. Blackham, who has practiced for fifty-five years in Dunkirk.

Extent of Public Nursing.—All of the first and second class cities of New York, thirty-eight third class cities, forty-five villages and seven towns are employing one or more public health nurses, paid wholly or in part from public funds. In three third class cities, thirty-three villages and three towns, not included above, the services of public health nurses are made available by private organizations. School nurses are employed in sixty cities, fifty-two villages and fifty-nine other school districts.

Fewer Births Attended by Midwives.—There has been a gradual falling off in the percentage of births reported by midwives until, in 1923, midwives reported only 9.3 per cent., or 9,447 births in the total upstate registration of 101,729 births. In 1916, licensed midwives in this state, exclusive of New York City, reported 16 per cent. of all births. Thus far this year, the state department of health has licensed 411 midwives, fifteen of which licenses were new and 396 renewals. There appears to be also in the cities a reduction in the number of births attended by midwives.

William Wilson, Alias Cohen, Sentenced.—William Wilson, whose real name is Cohen, arrested two weeks ago in Buffalo, was found guilty of obtaining money under false pretense and sentenced to six months in the penitentiary. Cohen is known to the police as the "miracle man." He admitted, it is reported, to administering "prayer treatments" to a person suffering from valvular heart disease and t receiving two payments of $15 and $10 each. Cohen was arrested on complaint of the Buffalo Better Business Commission (The Journal, September 6, p. 775, and November 8, p. 1516).

Health Week in Utica.—A health week was recently organized in Utica by a committee composed of the health officer and representatives of five civic organizations. Addresses concerning health were delivered before the five clubs interested, the Utica Ministers' Association, in factories, business colleges, private and public schools, before Boy Scouts and social workers, and talks were given in theaters between acts to acquaint the public with the aims of health week. As a result of the demonstration, the business men's clubs have taken under advisement the appointment of a permanent social hygiene committee to be represented in the general health committee of the city.

Injuries to Eyes.—In an analysis of the workmen's compensation cases by the state department of labor, it is reported that injuries to the eyes of employees cost employers in New York, during the year ending June 30, 1923, more than a million dollars. There were 602 cases of permanent injury to eyes of employes, resulting in 54,000 weeks of disability; twelve cases of combined eye and face injuries, resulting in 1,439 weeks of disability, and more than 800 other cases of injury to the eyes, resulting in temporary disability and the payment of compensation. According to this analysis, the amount paid for permanent eye injuries in New York is about one-eighth of the total amount paid for all nonfatal injuries in the industries of the state. The managing director of the National Committee for the Prevention of Blindness, Lewis H. Carris, says that the situation in New York is no worse than in other industrial states.

Legal Procedure Outlined.—In response to a request from the state department of health, Deputy Attorney General Bernard M. Cohen has outlined a procedure which may be followed by local boards of health in dealing with violations of regulations or failure to comply with orders to abate nuisances. The outline provides that on the report of a violation by a health officer, the board may issue a warrant for the arrest of the person failing to comply. The Public Health Law gives the board the right to impose a penalty of $100 for each violation. This fine is turned over to the municipality. In addition, the board may direct that the nuisance be abated within a reasonable time and on failure to comply, the board may command an injunction. The Public Health Law gives the board the right to enter the premises of an offender and to abate the nuisance. Injunction for abatement of nuisances can only be enforced with safety by an injunction action brought in a county supreme court.

New York City

Chiropractor Questioned in Jeweler's Death.—The refusal of two physicians called in shortly before his death to sign the death certificate of Ludwig Nissen, a wealthy jeweler, led to an investigation of the cause of death by the district attorney. The necropsy disclosed, it is reported, that death was due to acute osteomyelitis and pneumonia. A chiropractor, whose name was being withheld, had treated Mr. Nissen as recently as two days before his death.

Society News.—At an organization meeting, October 20, of fifteen dermatologists of Brooklyn, the Brooklyn Dermatological Society was formed and Dr. Elias W. Abramowitz was elected president, Dr. Binford Throne, vice president, and Dr. John C. Graham, secretary-treasurer.——At the three hundred and forty-fourth regular meeting of the Society of Medical Jurisprudence at the New York Academy of Medicine, November 10, Dr. Frank L. Rector, secretary, Conference Board of Physicians in Industry, New York, gave an address on "Medical Provisions of the Workmen's Compensation Laws."

Proposed Charities Disapproved.—An application for the approval of papers of incorporation for a proposed institution at Far Rockaway for the care of "nervous convalescents" was recently denied by a special committee of the State Board of Charities. Other applications, which were held over for investigation, were that of the East River Hospital, 307 East Broadway, now a private institution for the care of maternity cases, the Abigail Free School, which wishes to change to a day nursery, and the Hudson Guild, which has applied to establish dispensaries along with the renting of rooms to boys and young men.

New Private Hospital.—A site was purchased at 159-163 East Ninetieth Street, November 7, for a new private hospital, the Cranleigh. The building will be ready for occupancy by Sept. 1, 1925. The institution will be financed by a bond issue. Dr. A. J. Barker Savage, for many years superintendent of the Broad Street Hospital, will be director of the Cranleigh Hospital. Among physicians who have been selected to serve on the staff of the institution are Drs. Aspinwall Judd, Francis Huber, Edward Mahoney, John E. Hammett, James Pedersen, Walter T. Dannreuther, Abraham Moss, John McGrath and Douglas Symmers. The hospital will have a capacity of more than 100 beds.

Encouraging Quackery by Instructing Laymen.—A dealer in electromedical apparatus has issued invitations to a clinical course in electrotherapeutics in New York which give the impression of coming from a bona fide medical society. Eleven thousand invitations have been issued, according to *New York Medical Week*, while there are only about 4,000 physicians practicing in Greater New York. Almost two thirds of the invitations, therefore, presumably did not go to physicians. The vice president of the New York Electrotherapeutic Society, who attended the first lecture at the request of the president, noted that the lecture was not limited to physicians. The New York Electrotherapeutic Society and the American Electrotherapeutic Association almost two years ago adopted resolutions condemning such commercially promoted courses. *New York Medical Week* points out that such courses are merely a feature of a selling campaign and that by instructing laymen in the use of medical apparatus they encourage quackery. The same kind of campaign for selling electromedical apparatus has been tried out in Chicago, and probably in other large cities.

NORTH CAROLINA

Dr. Rankin Returns.—Dr. Watson S. Rankin, secretary of the state board of health, who, during a year's leave of absence, has been on duty with the International Health Board, New York, has returned to Raleigh and assumed his regular duties with the state health department.

OHIO

Smallpox at Ada.—Classes in Ohio Northwestern University, Ada, were suspended, October 30, while 1,150 students and fifty members of the faculty were vaccinated, it is reported, following the discovery of a case of smallpox at the university.

Society News.—Dr. Hugh H. Young, Baltimore, addressed the Academy of Medicine of Cleveland, October 17, on "Intravenous Treatment of Infections, General, Local, Urinary." Drs. John I. Hunter and N. D. Royle, both of Sydney, Australia, presented an informal discussion of the treatment of "Spastic Paralysis."

Academy Starts Credit Service.—The Academy of Medicine of Cleveland is starting a credit information service for its members which includes the publication of a list of patients who persistently ignore bills of physicians. The response of members to a letter sent out concerning this service has been immediate, and an estimate of the number of names the list will contain is from 5,000 to 10,000, depending on the number of members who send names of patients. The service is in the nature of an experiment. The plan will probably develop into semiannual additions and corrections to the original list.

Smallpox in Cincinnati.—The health commissioner of Cincinnati reported recently that there had been 213 cases of smallpox in that city this year, and that negroes, who constitute 9 per cent. of the population, contributed 70 per cent. of the cases. The outstanding feature of the smallpox situation in Cincinnati is that there have been no cases among children attending school. In the Harriet Beecher Stowe School, which is exclusively for colored children in the downtown center of the colored population, there was no smallpox. All of these pupils are vaccinated. In the last few months, in response to the health department appeals, 75,000 people in the city have been vaccinated, the funds for which were largely contributed by employers.

Personal.—Dr. James J. Chandler, Soldiers Home, Kan., has been appointed resident physician at the Mount Logan Sanatorium for tuberculous patients.——Dr. Willis A. Whitman, for three years prison surgeon at the Ohio penitentiary, Columbus, has resigned to enter practice. He will be succeeded by Dr. Clarence L. Perry.——Dr. George H. Reeve has been appointed neuropsychiatrist for the Cuyahoga County criminal courts. The creation of this department is the first move in the United States by courts higher than juvenile and municipal to solve the mental problems of criminals, it is reported.——Dr. John P. Rankin, Elyria, has accepted a position, on a part-time basis, in clinical surgery and surgical technic in Western Reserve University School of Medicine,

Cleveland.——Dr. Walter H. Roehll has been appointed assistant physician at the American Rolling Mills plant, Middletown.

Progress in Medical Education.—There is in Ohio an increased enrolment in the medical colleges. The freshman class at the Western Reserve University School of Medicine comprises seventy-five students, an increase of twenty over previous years. This has been made possible by the new medical building, which was dedicated, October 9. It is the first unit completed in a great medical center which will embrace eventually Lakeside Hospital, maternity and babies' hospitals, and a nurses' home. Preceding the dedication, Dr. John J. R. Macleod, Toronto, in addressing the Academy of Medicine of Cleveland and the Cleveland Advertising Club, emphasized the need of developing research. Dr. Harvey Cushing, Boston, a native of Cleveland, in honor of whose father the Cushing Laboratory of Experimental Medicine at Western Reserve is named, in his dedicatory address outlined the early history of Western Reserve University and of Cleveland and northern Ohio, with which the early history of the school is closely associated. The senior class at Western Reserve has forty-two members. Students from other schools are not accepted into the fourth year at Western Reserve University School of Medicine, as two years of residence are required for the medical degree.——The secretary of the faculty of the University of Cincinnati Medical College reports a steady increase in the number of applications for admittance to that school. There were 1,400 applications for admission to the freshman class this fall, of whom only seventy-two were admitted. There were sixty-five students admitted to last year's freshman class, fifteen of whom by the end of the year were relinquished, and sixty-five members now in the senior class.——The Ohio State University College of Medicine, Columbus, which recently partly moved into a new building on the campus, has a freshman class of ninety-five against seventy-five last year. The present senior class has ninety-two members compared to fifty-three who were graduated last spring.

OKLAHOMA

Personal.—Dr. James I. Hollingsworth, Muskogee, has accepted an appointment with the Spreckels Company Hospital, Del Carman, Pampanga Province, Philippine Islands. ——Dr. Dock Long, Duncan, has been appointed health officer of Stephens County.

PENNSYLVANIA

Testimonial Dinner.—The Hazelton branch of the Luzerne County Medical Society gave a testimonial dinner to Dr. Lawrence H. Smith, October 29. Dr. Smith has been a practitioner for forty-one years.

Medical Library.—The Academy of Medicine library, Pittsburg, announces that the circulating department is now open and that members of the Allegheny County Medical Society are cordially invited to make use of the library, which will be open daily from 9 until 5 o'clock, except Saturday, when it closes at noon.

Philadelphia

Memorial Fellowship.—A fellowship in neurology, the gift of Mrs. J. William White in memory of her husband, has been accepted by the board of trustees of the University of Pennsylvania.

Hospital Annex Opened.—A new $275,000 building for women with tuberculosis was opened, November 7, at the Philadelphia General Hospital. Each ward contains only from four to eight beds.

Conference During Antituberculosis Drive.—A feature of the 1924 Christmas seal sale of the Philadelphia Health Council and Tuberculosis Committee will be a tuberculosis conference, November 25, at which specialists in tuberculosis will speak. The aim of the campaign is to raise $150,000 for health work during 1925.

Personal.—Dr. A. V. Hill, professor of physiology, University of London, delivered the annual Gross lecture, November 13, at the College of Physicians, before the Pathological Society of Philadelphia.——Dr. Joseph C. Doane has been assigned by the director of the department of health, to assume charge of planning the new $4,000,000 Philadelphia General Hospital, Thirty-Fourth and Pine streets.

Hospital News.—The board of trustees of the Jefferson Medical College and its hospitals, Philadelphia, announces the opening of the Samuel Gustine Thompson Annex. At the dedicatory exercises held in the clinical amphitheater of the new building, October 30, Dr. William W. Keen, emeritus professor of the principles of surgery and of clinical surgery, Jefferson Medical College, among others, gave an address.

SOUTH DAKOTA

Abrams Exponent Recommended Expelled.—The board of censors of the Aberdeen District Medical Society, after an investigation, recommended that steps be taken to revoke the license of Dr. Sigmond Rosenthal, and that he be expelled from membership in the society, in view of his adherence to the so-called Abrams method of electronic medicine and the publication of a signed article in the Aberdeen *Evening News*, June 13.

TENNESSEE

Physician Fined.—Dr. LeRoy S. Griffin, Memphis, was fined $350 by Judge Sibley at Atlanta, October 22, after a jury found him guilty of violation of the Harrison Narcotic Law, it is reoprted.

Society News.—At the sixtieth semiannual meeting of the Middle Tennessee Medical Association, Lewisburg, November 13-14, every person on the program was a practicing physician. Among the thirty-five speakers, not counting those who took part in discussions, was Dr. William D. Haggard, Nashville, President-Elect of the American Medical Association, who addressed the society on "The Gallbladder Patient."

WEST VIRGINIA

Chiropractor Employs Physician.—The *West Virginia Medical Journal* calls attention to an advertisement carried in a West Virginia daily paper by a chiropractor, and says that advertising of this type appears in all papers of the larger cities of West Virginia. In Huntington, a full page chiropractic advertisement, with illustrations, was carried on the cover of the city telephone directory. In this case, the journal states that this particular chiropractor failed to mention that when he had typhoid fever, he called a regular physician to treat him. The Kanawha County Medical Society has ordered 10,000 reprints from the Curtis Publishing Company of their article on "Fake Doctors," which it proposes to distribute among its members for distribution among their patients.

Proposed Legislation Against Quacks.—The *West Virginia Medical Journal* publishes a proposed act to amend the laws of that state governing the practice of medicine, section 13 of which pertains to certain advertising quacks. It is in part as follows:

"Whosoever publishes, delivers or distributes, or causes to be published, delivered or distributed in any manner whatsoever in the state of West Virginia, any advertisement concerning a venereal disease, lost manhood, lost vitality, impotency, sexual weakness, seminal emissions, varicocele, self abuse or excessive sexual indulgence and calling attention to a medicine, article or preparation that may be used therefore, or to a person or persons from whom or an office or place at which information, treatment or advice relating to such diseases, infirmity, habit or condition may be obtained, is guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not less than one hundred dollars, nor more than three hundred dollars, or imprisonment in the county jail not to exceed six months, or both in the discretion of the court."

WISCONSIN

Society News.—Prof. W. Einthoven, University of Leyden, addressed the University of Wisconsin Medical Society at Madison, November 5, on "The Relation of the Mechanical and Electrical Phenomena of Muscular Contraction, with Special Reference to Cardiac Muscle." Prof. A. V. Hill, of the University of London, addressed the society, November 3, on "Muscular Contraction in Relation to Carbohydrate Metabolism."

CANADA

Labeling of Drugs.—The food and drug regulations issued April 8, 1924, as amended September 16, require that the label of all drugs manufactured or offered for sale in Canada under names not recognized in a British or foreign pharmacopeia or other recognized authority, nor registered under the Canadian Patent and Proprietary Medicine Act of 1919, shall, in addition to the name of the article, bear the name and address of the manufacturer or of the person for which the article is manufactured, the quantity of net contents in terms of measure or weight and a complete list of the medicinal ingredients, using only names by which they are commonly known. No misleading statements shall appear on the label as to the character of the article nor to the effect that it is a cure for any disease.

GENERAL

Joint Editorship.—The *Journal of General Physiology*, until recently edited by the late Jacques Loeb in association with Prof. Winthrop J. V. Osterhout, Ph.D., Harvard University, Boston, will appear in the future under the joint editorship of Professor Osterhout, J. H. Northrop, Rockefeller Institute, and W. J. Crozier, Rutgers University.

Warning.—It is reported that a man calling himself Dr. A. L. Lanning has cashed checks in Mexico which are disclaimed by the bank on which they are drawn. Clippings on file in the "personal file" maintained at the American Medical Association headquarters indicate that a man calling himself Dr. A. L. Lanning was arrested in St. Louis in September, 1908, on a similar charge.

New Tri-State Medical Society.—The organization of a tri-state medical society, comprising eight counties in West Virginia, four in Ohio and three in Kentucky, will be accomplished at an early date, it is reported. A committee, composed of the presidents of the medical societies of Cabell County, W. Va., Boyd County, Ky., and Scioto County, Ohio, has been appointed to formulate plans for the new society. Dr. James G. Murfin, Portsmouth, Ohio, is chairman of the committee.

Next Conference on Medical Education.—At a recent meeting of the Council on Medical Education and Hospitals, it was voted that the next annual conference occupy two full days and that the central topic of the program be "Twenty-Five Years' Progress in Medical Education." It will celebrate the completion of twenty-five years active work in medical education by the American Medical Association. The program, as heretofore, will be held as a part of an annual congress on medical education, licensure, public health and hospitals. The meeting will be held in the Congress Hotel, Chicago, Monday to Thursday, inclusive, March 9, 10, 11 and 12, 1925.

American Statistical Association Meeting.—The eighty-sixth annual meeting of the American Statistical Association will be held in Chicago, December 29-31. The president, Louis J. Dublin, Metropolitan Life Insurance Company, New York, has selected the topic "Population" after consultation with members of the association. Joint sessions have been arranged with the American Economic Association and the American Association for Labor Legislation. There will be three independent sessions, the first dealing with a statement of the problem, the second with the racial constitution of the population and the problem of immigration and the third dealing with the outlook for the future and the steps which should be taken in developing a rational public health, economic and social program.

Society News.—The next semiannual meeting of the Society of Neurological Surgeons will be held at the clinic of Dr. Claude C. Coleman, Richmond, Va., December 5-6. The secretary is Dr. Ernest Sachs, Washington University Medical School, St. Louis.——The next annual meeting of the American Association for the Advancement of Science and associated organizations will be in Washington, D. C., Dec. 29, 1924, to January 3, 1925. The American Medical Association is one of many organizations affiliated with the American Association for the Advancement of Science, and all members who have not yet enrolled in the latter organization may join before January 1, without paying the usual $5 entrance fee. Each member of the American Association for the Advancement of Science receives either the weekly *Science* or the *Scientific Monthly*. This special privilege probably will not be offered again to all members of affiliated organizations for several years.

Americans in Budapest Form Society.—American physicians studying in the hospitals and dispensaries of Budapest, Hungary, have formed "The American Medical Association of Budapest," it is reported. The organization collects information concerning conditions in that country and its hospitals, for the benefit of physicians who plan to study there. The interest in Hungarian facilities for postgraduate study seems to date largely from the International Medical Congress, held there in 1909, the success of which was largely due to efforts of Prof. Emil Gross and Baron K. Muller. The number of Americans now studying in Budapest is about twenty-five or thirty, while the number usually studying in Vienna is from 150 to 200. Thus far, Americans in Budapest have been studying only at the Budapest University but the privilege will be extended to the University of Pécs and probably to other universities. Dr. Max A. Werner, New York, is president of this organization.

Conference to Prevent Smuggling of Narcotics.—A conference is planned for the near future between Mexican and U. S. officials to discuss means of preventing international smuggling of narcotics. The discussion will include plans for stationing federal narcotic officers at all important points on the border where narcotics are being smuggled; the exchange of information between agents of the two governments as to names, photographs and other records relative to internationally known smugglers, and other plans similar to those in use along the Canadian border. A similar conference was held last year at Buffalo with Canadian officials, and the cooperation resulting has caused a marked decrease in the smuggling of drugs through Canada. The seizures of morphin smuggled from Canada dropped from 24,902 ounces in 1923 to 2,504 ounces in 1924; only 761 ounces of cocain were seized as compared with 15,686 ounces during the previous year. The seizures of morphin, heroin and codein were also greatly reduced. This decrease occurred in spite of a marked intensity in the activities of federal officers.

Bequests and Donations.—The following bequests and donations have recently been announced:

To the Federation for the Support of Jewish Philanthropic Societies of New York City, $40,000; to the Hudson Guild of the City of New York, $2,000; to the New York Association for Improving the Condition of the Poor, $2,500; the Guild for Crippled Children of the Poor of New York City, $1,500; the Children's Aid Society, for the use of the Newsboys' Lodging House, $2,000; St. Luke's Hospital, $2,000; the National Jewish Hospital for Consumptives of Denver, Colo., $2,500; St. John's Guild of New York City, $1,500; Roosevelt Hospital, $2,500, by the will of the late Solomon C. Guggenheimer.

The Portsmouth Hospital, Portsmouth, N. H., $40,000, by the will of the late Mrs. Sarah G. Salter to perpetuate the memory of her husband.

The will of Gilman L. Parker, Reading, Mass., provides for setting aside a trust fund, which it is estimated will aggregate $150,000, for the establishment of a hospital in Reading.

Mercy Hospital, Tiffin, Ohio, $1,000, by the will of the late Louis Pfeier.

The Deaconess Hospital, Lincoln, Ill., $15,000, the gift of Miss Effie Zollars of Lincoln, for the erection of a nurses' home.

The Hospital for Sick Children, Toronto, Ont., $2,000, by the late Mrs. E. Mercer of York Township, Ont.

For a community hospital in Louisiana, Mo., $100,000, by the will of Otis Smith, and $40,000, by the will of Susannah P. Barr.

The will of Catherine E. S. Stuyvesant directs that the residue of her estate, estimated at about $1,800,000, go toward the establishment of the "A Van Horne Stuyvesant Memorial Hospital" on the death of her brother and sister and their descendants, and that this institution be administered as a unit of St. Luke's Hospital, New York.

St. Mary's Hospital, Brooklyn Home for Blind, Crippled and Defective Children, Port Jefferson, L. I., and Mercy Hospital, Buffalo, each $6,848.77 by the will of Mrs. Catherine Augustin Caldwell.

The Hebrew Orphan Home and Mount Sinai Hospital, each $200, by the will of the late Cecilia Lebedinsky.

International Golden Rule Sunday.—Dr. William A. Pusey, President of the American Medical Association, who represents the medical profession on the Near East Relief Golden Rule Cooperating Committee, says Near East Relief deserves support because (1) it is raising the standard of health in the Near East; (2) it is educating orphans to perpetuate the program of sanitation and personal hygiene; (3) it has founded the first adequate Near East training schools for nurses; (4) it has saved 1,000,000 lives and rescued 100,000 children, and is now training 40,000 orphans for self-support. The object of the committee is to further the observance of International Golden Rule Sunday, December 7, for the purpose of promoting good fellowship throughout the world, and, at the same time, to provide for Near East Relief orphans. On that day, persons who believe in the Golden Rule are requested to provide for their dinner about the same menu provided for children in Near East Relief orphanages, and then to contribute to Near East Relief for food for orphans for the coming year. Soup, bread, stewed fruit and cocoa is a typical orphanage menu, and it costs less than 5 cents per child. Near East Relief has been chartered by Congress. It maintains thirty-three hospitals and sixty-one clinics in the Near East, supervised by eight American physicians, twenty-one American nurses, fifty-two local physicians and 121 local nurses. In addition to aiding 40,000 children under the protection of Near East Relief, there are 100,000 children living in refugee camps for whom no provision is made. They are victims of territorial and other changes resulting from the World War. It is to provide some measure of comfort for these children in Persia, Armenia, Palestine, Syria, Anatolia, Turkey and Greece that contributions are requested. The central headquarters is at 151 Fifth Avenue, New York City.

LATIN AMERICA

Authority for Paroling of Lepers.—The *Union Panamericana* relates that the physicians of the leper colony of Costa Rica applied to the medical faculty to authorize the paroling of seventeen lepers whom they considered practically cured. They were unwilling to assume alone the responsibility of releasing these inmates of the leper colony.

Medical Inspection of Schools in Nicaragua.—The recent regulations provide that the school inspector shall have as assistants sixth year medical students, and that the service in the schools is to be regarded as equivalent to work as an intern in a hospital. The school children are to be regularly examined annually, in the first four months of the school year.

Hahnemann Diplomas Annulled.—The *Brazil-Medico* gives a list of medical graduates of the Faculdade Hahnemanniana, Rio de Janeiro, whose diplomas have been annulled as not entitling them to the same privileges as graduates of the official medical schools. The list includes several who had transferred to the other school; the previous equivalent rating is no longer allowed.

FOREIGN

Belgium Enlarges Scope of Venereal Preventive Work.—The *Bruxelles-médical* gives the text of the decree which announces that gonorrhea and chancroid will now be treated in the dispensaries organized to combat syphilis, at state expense. Physicians will be paid the same for each consultation, namely, 3 francs, for each of these three venereal diseases.

German Society for Race Hygiene.—This society held a two-day meeting at Berlin in October. The main topic discussed was the organization of consultation stations for family and race hygiene, and of a central institute for research along these lines. A meeting open to the public was held, with addresses on "Marriage and the State," by Dr. Maria Munk and Professor Poll. Dr. Krohne of the state public welfare department presided at these meetings.

The Thone Prize.—Mr. G. Thone is a publisher of Liége, Belgium, who offers a prize of 5,000 francs for the best scientific work by a compatriot on "Radiotherapy Except in Cancer," to be selected by a jury of university professors. He will publish the work, allowing the usual royalties. The prize is to be annual, the topic announced three years in advance. For 1927, the topic is "Industrial Application of the Roentgen and Cathode Rays and Radioactive Bodies."

Negligence in Delay in Roentgen Examination.—The *Gazette des hôpitaux* relates that the court at Havre recently condemned a physician to pay a woman an annual pension of 360 francs on account of the amputation of her right forearm, holding him responsible. She had injured her hand while scrubbing, and he had treated it for a month without roentgen examination, notwithstanding the persistence and aggravation of the pains. Roentgenography revealed an unsuspected needle in the deep tissues, and amputation was required.

Royal College of Physicians of London.—Prof. Archibald E. Garrod delivered the Harveian oration, October 18, before the Royal College of Physicians at London, on "The Debt of Science to Medicine," after which the president, Sir Humphry Rolleston, presented the Weber-Parkes prize and medal to Prof. A. Calmette, subdirector of the Pasteur Institute, Paris, for research on tuberculosis, to whom the president referred as the foremost authority on this subject. The Moxon gold medal was then presented to Sir Leonard Rogers for research in clinical medicine.

Old Students' Dinner at Old Barts.—As usual, the opening of the winter session at St. Bartholomew's Hospital, London, was marked by the annual old students' dinner in the Great Hall of the hospital. Dr. John H. Drysdale, who recently resigned the post of physician at the hospital, presided, and at the head table were Sir Thomas Clifford Allbutt, professor of physics at Cambridge; Sir Archibald E. Garrod, professor of medicine at Oxford; Sir Anthony A. Bowlby and many others. In proposing continued prosperity to the hospital and medical college, the chairman referred to some pressing needs, particularly the construction of new operating theaters and ward laboratories. There are 800 students working at St. Bartholomew's, and, in the last year, 123 obtained the English conjoint qualifications.

International Congress on Military Medicine.—The official notice in regard to the Third International Congress of Military Medicine and Pharmacy at Paris, April 20-25, 1925, has been received. All officers belonging to or having belonged to the army or navy medical corps of an allied or neutral nation are invited. The subscription is 30 francs, to be sent to the treasurer, 66 rue de Bellechasse, Paris. Dr. Vincent, chief of the medical department of the French army, is the acting president, and the civic authorities are joining with the military to make the congress a memorable occasion. The first congress was held in Belgium, attended by delegates from twenty nations; the second at Rome with thirty-five nations represented. The circular states that a reduction of 25 to 50 per cent. will be allowed congress members on vessels of the Compagnie des Messageries maritimes and the Touache Compagnie de Navigation mixte, and the Société générale de Transport à vapeur. The organizing committee will help congress members during their stay in Paris and find them lodgings, but applications for accommodations must be received before Feb. 1, 1925, as visitors in Paris are expected to be unusually numerous at about the time of the congress.

Deaths in Other Countries

W. H. A. Jacobson, consulting surgeon and teacher of operative surgery at Guy's Hospital, author of "The Operations of Surgery" and "Diseases of the Male Generative Organs"; September 14, at Ewhurst, England; aged 77.——**Jan Marius Moll,** lecturer in psychiatry, University of the Witwatersrand, September 14, at Johannesburg, South Africa; aged 45.——Dr. **Tancredi Botto,** chief of staff of the Italian hospital at Buenos Aires.——Dr. **Juan Díaz,** Caracas, professor of hygiene and legal medicine at the University of Venezuela.——**John Hammond Morgan,** formerly president of the Medical Society of London and examiner in surgery at the University of Oxford, author of many papers in various medical journals on surgical subjects; recently, in London, aged 78.

Government Services

Hospitals Authorized and Amended

Pursuant to instructions of the Secretary of War, June 27, 1922, the organization of evacuation hospital No. 33, organized reserves (South Side Hospital Unit, Pittsburgh) has been authorized. The authorization, January 16, of General Hospital No. 39 as the Yale-New Haven Hospital Unit, New Haven, Conn., has been amended to read "New Haven Hospital Unit, New Haven, Conn."

Examination for the Navy

During January, 1925, examinations for candidates for the U. S. Navy Medical Corps will be held at naval hospitals at Washington, D. C., Boston, New York, Philadelphia, Norfolk, Va., Portsmouth, N. H., Pensacola, Fla., Charleston, S. C., Great Lakes, Ill., Bremerton, Wash., Mare Island, Calif., San Diego, Calif., and at the Fitzsimmons General Hospital, Denver. Formal application to take the examination should be made to the surgeon-general of the navy, Washington, D. C., not later than December 15. The sixty candidates who make the highest mark will be commissioned on graduation. The bureau of medicine and surgery of the navy has for two years been commissioning graduates of Class A medical schools in the navy, and assigning them to the larger naval hospitals for internships. On accepting a commission as lieutenant, junior grade, the intern will immediately receive compensation at the rate of $2,699 per year, if he has no dependents, and $3,158 if he has dependents. Interns are assigned to base hospitals at Boston, New York, Philadelphia, Norfolk, Mare Island, Calif., and San Diego, Calif.

U. S. Public Health Service

Dr. Thorvald Madsen, Copenhagen, Denmark, chairman of the health committee of the League of Nations, recently visited the hygienic laboratory, U. S. Public Health Service, Washington, D. C., to inspect the serum control work, which is closely allied to the work of the Danish state serum institute, of which Dr. Madsen is director. While in Washington, Dr. Madsen addressed a joint meeting of the Bacteriological Society of America and the Association of Scientific Personnel U. S. Public Health Service on "Immunochemistry."——Surg. Walter W. King has been directed to proceed from Paris to Constantinople, Turkey, to attend a meeting of the American High Commission and then to proceed to Smyrna, Turkey, and Patras, Greece, to inspect methods of handling cargoes with reference to preventing the introduction of cholera into the United States.——Asst. Surg. M. V. Veldee has been assigned to duty in Chicago in connection with the stream pollution investigations of the service.——Surg. Leslie L. Lumsden has been directed to proceed from Washington, D. C., to places in Michigan, Illinois, Missouri, Iowa and Kansas, for conferences with state and local authorities concerning rural sanitation.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 29, 1924.

Acquittal of Dr. Hadwen

The trial of Dr. Hadwen on the charge of manslaughter at the Gloucester assizes has excited enormous public interest. Even during a momentous general election, the London press devotes to the case large headlines and many columns. In the small city of Gloucester it is the one engrossing topic. The crowd outside the court, which cheered Hadwen, was so great that a strong force of police, including mounted men, was necessary to preserve order. In opening the case, the counsel for the crown stated that the prosecution alleged that the death from diphtheria and pneumonia of a girl, aged 10 years, was due to gross inattention and want of knowledge on the part of Hadwen, who failed to detect the disease and administer the proper remedy. The defense was conducted by Sir Edward Marshall Hall, a prominent criminal lawyer. A physician who was called in on the last day and found the child dying from diphtheria gave evidence that her temperature was 102.5 F. and pulse 154, and that she was suffering from toxemia. In cross-examination he admitted an acrimonious correspondence with Hadwen with regard to vaccination in Gloucester. Sir William Willcox, medical adviser to the home office, expressed the opinion that in all cases of suspected diphtheria a swab should be taken and antitoxin administered. "Diphtheria antitoxin," he said, "is one of the greatest discoveries of medicine. It has reduced the mortality of diphtheria from 30 to 40 per cent. or even more to 10 per cent. and under." He considered that the symptoms showed diphtheria conclusively and had no doubt that the pneumonia was secondary to it. On cross-examination, Sir Edward Marshall Hall quoted official figures showing that there were 2,021 wrong diagnoses of diphtheria within the London area in 1921, and 1,985 last year. Sir William Willcox, in reply, said that the explanation was that there was so much overcrowding that a physician would send a case on suspicion to a hosiptal without waiting for a swab to be taken. "It is hardly fair," he said, "to call them mistaken cases of diphtheria diagnosis. They are cases of suspicion diagnosis. If these mistakes were not made, the amount of diphtheria in London would be much greater." Replying to the judge, he said that the evidence of the value of antitoxin was so strong that it was the physician's duty to give it. Sir Edward Marshall Hall said: "Then it comes to this, that if any physician honestly believes that any antitoxin or serum is harmful, he must give up practice." Sir William Willcox replied: "My answer applies only to diphtheria. There are many sera and vaccines in regard to which medical opinion is not decided." "Is there not a body of medical opinion in this country which believes that antitoxin for diphtheria is harmful?" "I am not aware of it." "Then a physician must be guilty of wilful neglect if he does not administer antitoxin even though he does not believe in it?" "I am afraid my answer must be yes." This closed the case for the prosecution.

Dr. Hadwen, who is described in the newspapers as a tall man of venerable appearance, gave his evidence in a booming voice. He said that he had been in practice for thirty years and was a life-long teetotaller, a vegetarian for forty years, and had never been vaccinated. He had had a fair amount of experience with diphtheria and never administered antitoxin, and in all his cases had been successful. In the present case he gave vinegar and water, which he had employed successfully in thousands of cases. When called, there was no suspicion of diphtheria and he diagnosed tonsillitis. When he saw the child for the last time, he was thunderstruck with the change for the worse. "The throat had cleared and I concluded that she had pneumonia." He would not allow any of his patients to be treated with antitoxin by another physician. He had scathingly attacked the whole system for years in articles and pamphlets. "As president of the largest antivivisection society in the world, I urge others to follow my line." Asked as to the bacillus of diphtheria, he said: "I look upon it as the result of the disease and not as its cause. To inject poisoned horse blood into a human body is unscientific." Asked by the judge, "Does that apply to the treatment of all disease?" "Yes, I discard the whole germ theory of disease. I believe it is an absolutely unscientific idea."

In summing up, Mr. Justice Lush said that it would be deplorable and disastrous if a physician acting honestly in his treatment were to have the fear hanging over his head that if anything went wrong he would be charged with manslaughter. The case required strong and clear proof that there had been criminal neglect. They were not there to say whether Dr. Hadwen's views were wise or not. If a physician were culpably negligent and the patient died, it was not enough in support of an indictment of manslaughter to prove that if the physician had been careful the patient would have had a chance. They must prove that in all human probability if care had been used the child would have recovered. Carelessness was not enough. There were many cases of negligence in which death had been caused, when a person might have to pay damages, but he would not be indicted for manslaughter. Unless the negligence was so gross as to make one say it was wicked negligence, it could not amount to manslaughter. The singular aspect of the case was Dr. Hadwen's views as to the germ theory of diphtheria and its treatment by antitoxin. "We are not here as a tribunal to criticize them, but it is legitimate to say that it would be very unfortunate if any physician should shut his eyes to matters generally accepted by the profession unless he had good grounds. But a man is allowed to follow the medical profession, if properly qualified, even if he holds peculiar views; and if he acts as he considers best he is not guilty of culpable neglect. I don't pass judgment on Dr. Hadwen, but I say that a man may get his mind into such a state of prejudice and his judgment so blinded that he would rather sacrifice his patients than his prejudice. If such a man is so prejudiced that he is unwilling to avail himself of the discoveries of the profession, I can understand a jury saying that he is guilty of wilful neglect."

After an absence of twenty minutes, the jury returned a verdict of "Not guilty," which was received with such applause in a crowded court that the judge admonished the demonstrators. The result might have been expected, for in this, as in other English-speaking countries, cranks of all sorts, antiscientific as well as others, receive not only great tolerance but considerable support. Moreover, Dr. Hadwen is a leader in this country of the antivivisection agitation and has a considerable following in Gloucester. Though civil actions to recover damages against physicians from malpractice are not uncommon, prosecution for manslaughter is extremely rare, and generally fails. This has always occurred in cases similar to the foregoing, treated by Christian scientists.

Adulterated Food

Official reports just issued show that during 1923 the percentage of adulteration was the lowest ever recorded, 6.1 per cent. The figure for 1921 was 6.7 per cent.; that for 1922 was 6.2 per cent. In London, the percentage of adulteration was only 4.6. Milk was the most frequent article to be adulterated. In one case a plea that rain-water had fallen

into a churn was disproved in an ingenious manner by the local inspector, who happened to be also the local meteorological officer. He was able to show, by calculations based on the rainfall, the area of the churn lid, and the quantity of milk in the churn, that the rain could not account for more than 0.39 out of the 9 per cent. of added water found in the sample. A fine of $250 was imposed. Butter furnished 1.5 per cent. of adulterated samples, as compared with 1.7 per cent. in 1922. A "preservative" sold for use in cream, under a proprietary name, was found to consist of ordinary commercial borax. The venders of this preservative were subsequently fined for having sold a food preservative contaminated with 200 parts of arsenic per million. There was a large increase in the proportion of samples of jam reported as adulterated, as compared with 1922. The most usual form of adulteration consisted of the "improvement" of jams derived from dearer fruits by addition of cheaper fruits and juices.

PARIS

(From Our Regular Correspondent)

Oct. 31, 1924.

The Brain of Anatole France

The family of Anatole France hesitated at first to give the necessary authorization for the anatomic examination of the brain of the eminent writer. Some regarded such an action as desecration. Others, on the other hand, regarded the request as an exceptional honor, since the brains of only famous men are thus examined, reference being made, in this connection, to Goethe, Lamartine, Victor Hugo and Gambetta. The family finally took the latter view of the matter, and the necessary permission was given. Dr. Guillaume, to whom the examination of the brain was entrusted, emphasized the great scientific interest associated with the study of such a brain. Unfortunately, the family is unwilling for him to publish his findings. Dr. Guillaume has therefore confined himself, for the present, to the statement that, with respect to the amplitude, the number and the delicateness of the convolutions, the brain of Anatole France constitutes *une pièce unique*.

The Number of Diplomas Issued to Doctors of Medicine During the School Year 1923-1924

The French facultés de médecine issued 1,289 diplomas to doctors of medicine during the school year 1923-1924, which were distributed as follows:

	State Diplomas	University Diplomas	Total
Algiers	43	1	44
Beirut	28	..	28
Bordeaux	133	27	160
Lille	45	..	45
Lyons	152	42	194
Montpellier	103	7	110
Nancy	29	10	39
Paris	496	58	554
Strasbourg	42	15	57*
Toulouse	53	5	58
	1,124	165	1,289

* Under the French régime, which does not include fourteen diplomas issued on the basis of the German régime, nor two candidates who were admitted to the state examination (the German *Staatsexamen*).

The Fourth Pediatric Congress

The first congress of French-speaking pediatricians was held in Paris in 1913. The second congress was to have been held in Lyons in 1914, but was postponed on account of the war, and took place, then, in Paris, in 1922. The third congress was held last year in Brussels. The Association des pédiatres de langue française has recently decided that henceforth a congress will be held only every two years—alternately in Paris and in a foreign city. The next congress will therefore take place in Lausanne, toward the end of September, 1926. Three main topics were on the agenda of the fourth congress, which recently convened in Paris, under the chairmanship of Professor Marfan of Paris.

TREATMENT OF PURULENT PLEURISY IN THE CHILD

The opening papers on purulent pleurisy in the child were contributed by Drs. L. Ribadeau-Dumas of Paris and H. L. Rocher of Bordeaux, who, after emphasizing the high percentage of purulent effusions of the pleura in the child (according to Netter, from 33 to 50 per cent. of the cases, whereas, in the adult, the percentage is around 15), referred to the difficulties of diagnosis, especially in young children. Roentgen rays and exploratory puncture must be relied on to complete the clinical examination.

From the operative point of view, the prognosis of purulent pleurisy is determined to a great extent by the condition of the lung, for, in most cases, even when it appears to be primary, purulent pleurisy is secondary to pneumonia or bronchopneumonia. The pleural effusions coincident with a pulmonary affection are usually more serious than otherwise, because they are more copious and more highly infected. Operative mortality is higher in early interventions, while an infection is fully active. There are three forms of intervention: (1) thoracentesis; (2) siphon drainage, and (3) thoracotomy. Thoracentesis, single or multiple, with or without antiseptic injections (methylene blue, methyl violet, hexamethylenamin), may effect a recovery. More frequently, however, such punctures afford only partial relief, but give the organism an opportunity to recover somewhat so as to withstand later a more effective intervention. Siphon drainage with a retention catheter is a simple method, which is favored by English, American and German pediatricians. Ribadeau-Dumas and Rocher, however, have not found the method practical in dealing with infants, since the tube is easily displaced. There are three forms of thoracotomy: (1) simple pleurotomy; (2) pleurotomy with rib resection, and (3) transcostal thoracotomy by trepanation of the rib, an operation little used. In the child, local anesthesia by infiltration of the thoracic levels is preferable to general anesthesia, especially in case there are grave concomitant lesions of the lung. All statistics agree in pronouncing operative intervention extremely grave in purulent pleurisy in children under 2 years of age, and emphasize the superiority of conservative procedures (thoracentesis, siphon drainage, minimal thoracotomy). Thoracotomy should be barely sufficient for the passage of drain. Pneumothorax should be feared and avoided; also the influx of air resulting from wide incisions, and extensive rib resections. The extent of a thoracotomy should not be determined by the quantity of the effusion. For children under 2 years of age, opinion is divided with respect to the advantages of simple pleurotomy and thoracotomy with rib resection. The final outcome depends, to a great extent, on the nature of the postoperative care. Lavage of the pleura after the intervention is especially indicated in grave septic or purulent pleurisy. The injection of surgical solution of chlorinated soda by continuous irrigation, as in the Carrel technic, is sometimes indicated. Respiratory exercises, if introduced early, will bring about a gradual expansion of the lung, its adhesion to the pleura, and, consequently, cicatrization, but, at the same time, the mobilization, the enlargement and the rendering more supple of the side of the thorax operated on; it is the best preventive treatment of pleuritic scoliosis. In tuberculosis, with purulent pleurisy, thoracotomy should not be resorted to, and the chief reliance must be placed on punctures. The injection of modifying fluids has met with no success, but injections of air or of nitrogen are recommended. If there is a mixed infection, the prognosis is seriously compromised.

During the discussion that followed the presentation of these papers, Dr. P. Woringer of Strasbourg called attention

to the good results that may be secured by applying ethylhydrocuprein after puncture of the pleura, to exert a specific action on the pneumococcus. In pneumococcal pleurisy the fever abates within from twenty-four to forty-eight hours following the first injection, and the bacteriologic test of the effusion, which is always positive in the beginning, usually becomes negative after one or two injections. Woringer advises puncturing with a needle of large caliber, followed by the aspiration of as much pus as possible with the aid of a syringe; then the injection of a 5 per cent. sterilized solution of ethylhydrocuprein on the basis of 0.5 c.c. per kilogram of body weight of the child, but not exceeding 0.5 gm. as a dose. The injection is repeated for three or four days in succession, after which treatment is discontinued. If the fever again rises, the injections are renewed for two or three days.

VIENNA

(From Our Regular Correspondent)

Oct. 12, 1924.

Eighty-Eighth Meeting of the "German Naturalists and Physicians" in Innsbruck

The "Society of German Naturalists and Physicians" held its eighty-eighth meeting the last week of September at Innsbruck (Tyrol). This society convenes in different towns from year to year, alternating in the South and the North of Germany. This year the attractions of the beautiful mountain capital of the Alps were chiefly responsible for the large number of members that took part in the proceedings. More than 6,000 guests were present, with their ladies, and more than 1,200 papers were presented; but, as was natural, numerous important reports and papers were read simultaneously in the different lecture halls. There was also no distinct separation of the papers of purely medical interest from those of a general scientific nature, since the majority of the university authorities hold that, not only must every doctor of medicine be in a high degree a natural scientist, but also every natural scientist must have a fair knowledge of medical subjects.

Professor Doerr, director of the hygiene institute of Basle, Switzerland, read a paper on idiosyncrasy in which he pointed out that this hypersusceptibility to certain substances is constant in the same individual organism, and that these substances may be quite free from effect in the normal organism; the symptoms of this increased susceptibility are very similar to one another, regardless of what the "noxious" substance may be. The so-called anaphylactic shock, according to Doerr, is identical with idiosyncrasy; but it is produced by albumin bodies, while the latter may also be caused by non-albuminous bodies. The anatomic basis of these conditions is as yet unknown. It is perhaps due to an abnormal, inheritable permeability of the walls of the finest blood vessels.

In the section on radiology, Professor Haudek of Vienna showed a series of photographs by which he could prove that even most advanced lesions of pulmonary tuberculosis are capable of spontaneous retrogression or "cures." Clinical examination alone cannot give definite results in such cases; roentgen rays were required to obtain a clear picture of the decursus morbi. The argument for and against the interruption of pregnancy on account of pulmonary tuberculosis should take these findings into consideration.

"Occupational Work—A Physiologic Problem" was the title of a paper by Professor Ditzler from the Physiologic Institute of Berlin.

A review by Professor Bumke of Munich of the present situation of clinical psychiatry showed in what degree medical knowledge is influenced by pure natural science.

An interesting paper on the pedigree of a peasant clan in which dementia praecox predominated was presented by Dr. Boeters, who laid stress on the necessity of sterilizing the mentally or morally defective.

The problem of the "interruption of life," the condition known as hibernation among the lower animals and plants, was studied by Peter Rahm. Even the extreme low temperature of liquid helium (—269 C.) cannot destroy the life of certain organisms.

A long discussion followed Professor Wagner's paper on the problem of goiter. By giving very small doses of iodin to the younger part of the population for a protracted period, we are able to suppress or markedly diminish the occurrence of disturbances of the thyroid gland. But in adults, utmost care must be taken because severe intoxication may follow, unless a constant supervision is provided for.

In the section on veterinary medicine, Professor Schnürer read a paper on rabies. More than 90 per cent. of all the human cases are caused by mad dogs. Therefore the immunization of dogs against rabies is of the utmost importance to public health. In Austria, since 1922, we have had a law permitting this procedure. Professor Reisinger of Vienna reported on the vaccine treatment of infective abortion among cows. The results are not gratifying.

A series of papers dealt with the problem of cancer. The majority were merely cursory, as the real discussion is reserved for the cancer convention, to be held in Vienna, October 15.

How many inhabitants live now and could live on the earth? This problem was discussed by Professor Penck of Berlin, who stated that at present the anthropogeographic methods calculate the population at 1,800 millions, while the possible population, if all the productive energies of the various climatic regions are taken into consideration, must be estimated at from 8,000 to 9,000 millions, or five times the number of today. Anyhow, we must look forward to a rapid increase of our population if the present rate of increase is maintained: In 300 years we might reach the maximum. This would necessitate the intensive cultivation of the moist tropical districts—a very difficult enterprise. Then 29 per cent. of humanity would live in Africa, 26 per cent. in Asia and Europe, 25 per cent. in South America, 14 per cent. in North America, and 6 per cent. in Australia. The bulk of the population would live in the hot climates, the center of gravity of mankind would be shifted from the white races to the colored ones, and cultural and social changes would be extreme.

An interesting contribution to the indications for premature termination of pregnancy was given by Professor Alexander of Vienna. All affections of the inner ear, also otosclerosis, are apt to progress rapidly so long as pregnancy continues, and subacute purulent inflammations are sometimes aggravated during this condition.

A large number of papers were contributed in the section on botany and zoology. Professor Frisch of Breslau read a paper on the "language" of bees, which is based on certain movements called "dances," and he also proved that bees are capable of discerning yellow, green, blue, violet, purple and orange, but not scarlet-red, which to them is black. Professor Knoll of Prague presented a paper on the physiology of insects in regard to sight and hearing. Certain butterflies, such as the morosphinx, even seem to have a memory.

A contribution dealing with the correlation of plants and birds in the tropical regions was read by Professor Porsch of Vienna. He showed that certain tropical flowers—so-called "bird flowers"—require birds for the transmission of their pollen. The birds obtain honey from the flowers, which are always bright colored, chiefly yellow, bright red and pure blue, and they are attracted only by the colors, as the flowers are odorless. The "insect flowers," however, attract their pollen transmitters by the odors they emit.

A most interesting section was that of the physicists, in which the modern views on the theory of atoms were discussed. The discoveries of Rutherford, Plaack, Bohr and Einstein have revolutionized our ideas of the composition of matter. Bohr, especially, has succeeded in offering an excellent working theory on the constitution of the hydrogen atom, from which he can derive all others by exact mathematical processes. He has constructed a "model of the atom" which falls in admirably with our present knowledge of radioactive matter. These difficult problems will undoubtedly have a great influence on the development of science.

This short review of the proceedings of the meeting comprises, of course, only a fraction of what was presented.

Control of Prostitutes in Vienna

From time to time, control of all registered prostitutes is undertaken at police headquarters by the medical staff. The last "census" was made in January, 1924, when 1,287 girls (against 1,349 in the previous year) responded to the call. One hundred and forty-four new girls had applied in that year for a "book," of whom eighty-four were below 19 years of age. Ninety-two per cent. of these juveniles and 58 per cent. of the adults making application had venereal disease. The oldest prostitute of all was 61; no girl below 18 is allowed to register. As regards the age groups, naturally the women were mostly young, but only few were less than 22 (hardly 6 per cent.). The majority were between 22 and 30 (about 40 per cent). Thirty per cent. were between 31 and 40, while 4 per cent. were over 45 years old. It is interesting that alcoholism of the father was reported in only 23 per cent. of the total, while the majority had a "clean" paternal history. Altogether, it is manifest that the number of public prostitutes has been steadily declining within the last four years, not only as regards newcomers, but also those already registered.

BERLIN

(From Our Regular Correspondent)

Oct. 18, 1924.

Tuberculosis in Germany

In the *Zeitschrift für Hygiene und Infektionskrankheiten* (Volume 103), Professor Möllers states that the mortality from tuberculosis, which was gradually decreasing before the war, has shown an upward tendency since 1914, and especially since 1918. The highest mortality since the war was reached in 1919; namely, 26.4 per 10,000 of population. In 1923 the mortality was 11.5 per cent. above that of 1914. A separate record has been kept of cases of tuberculosis in children under 15 years of age in the large cities of Germany, since Jan. 1, 1923, and during that year the rate was 2 per 10,000 of population. Since these large cities comprise about 27 per cent. of the whole population of Germany, the number of children under 15 dying of tuberculosis in all Germany in 1923 may be estimated at more than 12,000. But the increase in mortality has affected more especially the 15-25 age group of males. Möllers emphasizes that, in the case of so chronic a disease as tuberculosis, the mortality rate alone is not an accurate indicator of the extent to which tuberculosis has been disseminated among the people; the morbidity rate is at least just as important. Heretofore no reliable statistics from the whole country in regard to the morbidity rate have been available. In Prussia, where, since Jan. 1, 1924, every infectious case of pulmonary and laryngeal tuberculosis is notifiable, in the first three months of the present year 14,000 such cases were reported, and the total number of cases for the year will doubtless exceed 50,000. Since the population of Prussia (38,000,000) is approximately 61 per cent. of the population of Germany (62,000,000), there must be around 100,000 persons in Germany with infectious pulmonary or laryngeal tuberculosis. But if one takes into account the fact that, owing to the short time that has elapsed since the introduction of the Prussian law with regard to tuberculosis, the law is not complied with in all cases, it is probable that the actual number of persons in Germany with infectious tuberculosis will exceed 200,000. In the face of this enormous morbidity, the measures heretofore adopted to combat the spread of the disease—especially the number of beds in the larger tuberculosis sanatoriums—seem entirely inadequate. According to statements published by the Central Committee for the Combating of Tuberculosis, there are in Germany around 514 tuberculosis sanatoriums with 43,000 beds, 20,000 of which were estimated to be occupied by patients with infectious forms of tuberculosis, so that, out of 200,000 persons estimated to be suffering from open tuberculosis, only about one tenth are receiving rational institutional care and treatment. Further retrenchment in this field is therefore out of the question. On the other hand, since, owing to the present economic situation, the erection of new tuberculosis sanatoriums seems impossible, Möllers recommends that, in the German crusade against tuberculosis, the main emphasis be placed on the development of welfare work among the tuberculous.

The Value to a Physician of the Ability to Judge a Person's Handwriting

Professor Schneidemühl, who for many years served as an instructor in comparative anatomy and veterinary medicine at the University of Kiel, devoted himself in his leisure moments to the study of the interpretation of handwriting.

Since the peculiar character of a person's handwriting is determined mainly by cerebral influences, its medical significance and interpretation must be sought through the physiology of the central nervous system, together with psychologic considerations. Especial attention must be given to all peculiar strokes and flourishes, and to the position, form and slant of the letters, provided such peculiarities occur with regularity. Examination of handwriting enables one to draw conclusions with reference to qualities of character and emotional states of the writer at the time the document in question was written, but does not permit conclusions relative to permanent mental qualities and capacities. Any violent emotions are at once reflected in one's handwriting. Otherwise firm, straight and left-slanting strokes become weaker, finer and more inclined to the right, corresponding to the lessened resistance and the weakened will power caused by the emotional excitement. The tendency of the lines to drop down at the right becomes very marked. Persons with a pronounced joyful disposition are inclined to use long beginning strokes at the commencement of words and also for the letters in the middle of a word. As the result of severe emotional disturbances, these flourishes grow smaller and finally disappear altogether. In the case of persons who ordinarily are very precise, and whose letters, words and lines are exactly spaced, the letters become uneven and the spacing between letters, words and lines varies markedly. Persons who usually attach great importance to appearances and are therefore in the habit of adding flourishes to the capitals commonly omit all superfluous strokes when agitated, and their writing becomes plain and simple. A wavy motion of the lines is exceedingly characteristic of persons suffering from emotional excitement. These changes in the peculiarities of the handwriting are noted frequently in the 13-18 age group, in which great psychic changes occur. A school physician who is able to judge handwriting will often have his attention called to psychic changes in pupils by the changes in their writing. When persons recover from their psychic disturbances and the mental equilibrium becomes reestablished, the above mentioned changes in their handwriting disappear completely. Likewise, for the medicolegal expert a study of a

criminal's handwriting is important, for the handwriting will show in what state of mind a given document was written.

Aid to Prospective Mothers and Lying-In Patients Insured in the Health Insurance Societies

An order of the federal minister of labor provides for changes in the law concerning the payment of maternity benefits and insurance. According to the new order, women who, during the last two years previous to their confinement, were holders of health insurance, under the federal health insurance act, for a period of at least ten months, and, during the last year before their confinement, held such insurance for at least six months, are entitled to receive: (1) medical treatment at confinement and during the period of pregnancy; (2) a single sick benefit toward the cost of other needs in connection with illness during pregnancy and confinement, in the sum of 25 gold marks ($6); (3) a weekly benefit equal to the amount paid in ordinary illness, but amouting to at least 50 gold pfennigs (12 cents) daily for four weeks previous to and six weeks immediately after confinement; the weekly benefit for the first four weeks is due, at the latest, on the day of confinement; (4) a special benefit, to be paid the mother so long as she nurses her child, and amounting to half of the sick benefit, but to at least 25 gold pfennigs (6 cents) daily for a period of twelve weeks after confinement. The board of directors of a health insurance society is empowered to establish a maximum amount to be paid to mothers while nursing their children.

The board of directors of a health insurance society may provide free services of a midwife and free medicines in illness during pregnancy and in confinement cases. In this case the cash benefit to the lying-in patient is reduced to 10 gold marks. If there is no confinement, no confinement benefit shall be paid.

In provinces or states in which, according to law, a publicly constituted board is empowered to pay the dues to midwives or guarantees a definite minimal income, it may be further decreed that the health insurance society shall pay a portion of the single benefit, up to 15 gold marks ($3.57), to the board instead of to the lying-in patient. In that case, the amount so paid to the board must be credited to the puerperant as part payment on the sum that she is to pay for midwife care.

If, during pregnancy illness or at confinement, medical treatment is needed, the health insurance society may elect, in the aforementioned cases, to grant the puerperant a cash benefit in lieu of performances in kind.

Marriages

ALEXANDER E. BURKE to Dr. Emelie Elizabeth Mundy, both of Philadelphia, at Wilmington, Del., October 22.

ADAM PHILLIPS LEIGHTON, JR., Portland, Maine, to Miss Anne Leahy of Worcester, Mass., October 29.

ROBERT SCOTT MARTIN to Miss Rachel Cowden, both of Red Cloud, Neb., at Oak Park, Ill., October 15.

ROY C. NOBLE, Leadville, Colo., to Miss Mildred Jean Davidson of Buena Vista, September 28.

BATTEY BELT COKER, Rome, Ga., to Miss Margaret McCoy of Nashville, Tenn., September 6.

SAMUEL WATSON RAMSAY to Miss Lucile Dorothy Baker, both of Chicago, October 25.

L. FORREST SWANK to Miss Mary Geraldine Conrad, both of Elkhart, Ind., August 31.

ETHEL B. COSBY, Hewlett, N. Y., to Mr. Howard Adler of Far Rockaway, October 25.

ISAAC B. PERKINS, Denver, to Miss Ethel L. Wilhelm of Zanesville, Ohio, recently.

JOHN G. MURRAY, Greenville, S. C., to Miss Lila Graham of Gaffney, October 9.

Deaths

Bret L. Vilna ⊕ Cicero, Ill.; University of Illinois College of Medicine, Chicago, 1911; clinical assistant surgeon, Northwestern University Medical School, Chicago; formerly on the staffs of the Wesley Memorial Hospital, Chicago, and the West Suburban Hospital, Oak Park; for seven years health commissioner of Cicero; aged 38; died, November 3, following cholecystectomy.

Charles Sumner Pratt, Brattleboro, Vt.; Medical Department of Columbia College, New York, 1884; member of the Vermont State Medical Society; for six years on the staff of the Brattleboro Retreat; aged 68; died, October 25, at East Putney, of carcinoma of the stomach.

John Lemuel Murray Willis, Eliot, Maine; Medical School of Maine, Portland, 1877; member of the Maine Medical Association; past president of the York County Medical Society; member of the Maine Board of Registration of Medicine; aged 69; died, October 25.

Joseph T. Clegg, Siloam Springs, Ark.; University of Nashville Medical Department, 1873; member and at one time president of the Arkansas Medical Society; past president of the board of health; formerly member of the state legislature; aged 74; died, October 19.

Charles B. Adams, Sac City, Iowa; Cleveland (Ohio) University of Medicine and Surgery, 1883; past president of the state board of medical examiners; member and formerly president of the state board of health; aged 65; died, October 21, of cerebral hemorrhage.

Frederick Lee Beckley ⊗ St. Paul; University of Minnesota College of Homeopathic Medicine and Surgery, Minneapolis, 1897; bank president; aged 53; died, October 23, at St. Joseph's Hospital, following an operation.

Charles Burchell Shirley, Weiser, Idaho; Howard University School of Medicine, Washington, D. C., 1879; member of the Idaho State Medical Association; aged 76; died, October 15, at St. Luke's Hospital, Boise.

August F. Eimbeck, New Haven, Mo.; St. Louis Medical College, 1866; member of the Missouri State Medical Association; aged 82; died, September 1, at the Deaconess Hospital, St. Louis, of cerebral hemorrhage.

Lyman W. Armentrout, Mount Vernon, Ohio; College of Physicians and Surgeons, Baltimore, 1871; aged 79; died, October 23, of injuries received when the automobile in which he was driving was struck by a train.

Jeremiah P. Lawlor, Parkersburg, W. Va.; Baltimore Medical College, 1898; formerly demonstrator of anatomy, bacteriology and pathology at his alma mater; aged 52; died, October 6, of cerebral hemorrhage.

Joseph Henderson Reed, Sharon, Pa.; Miami Medical College, Cincinnati, 1878; member of the Medical Society of the State of Pennsylvania; aged 68; died suddenly, September 30, of cerebral hemorrhage.

James Gilbert Eberle, Fort Smith, Ark.; Kentucky School of Medicine, Louisville, 1875; member and at one time president of the Arkansas Medical Society; aged 70; died, October 22, following a long illness.

Morgan J. Jenkins, Plain City, Ohio; Miami Medical College, Cincinnati, 1878; member of the Ohio State Medical Association; aged 70; died, October 26, at the Grant Hospital, Columbus, of pneumonia.

Eloise Olivia Richberg, Chicago; Hering Medical College, Chicago, 1908; formerly professor of embryology at her alma mater; aged 75; died, October 7, of chronic myocarditis and cerebral hemorrhage.

D. Mitchell Ford, Hartsville, Tenn.; University of Tennessee College of Medicine, Memphis, 1893; aged 59; died, October 16, at an infirmary at Nashville, following an operation for gallstones.

George Thomas Allison, Fort Worth, Texas; Eclectic Medical Institute, Cincinnati, 1893; Fort Worth School of Medicine, 1902; aged 54; died, July 14, of cardiorenal disease and arteriosclerosis.

Walter Colfax Matthews, Butte, Mont.; College of Physicians and Surgeons, Baltimore, 1892; formerly city physician; aged 55; died, October 16, following a long illness.

Max Jason Salamson, Chicago; Rush Medical College, Chicago, 1904; member of the Illinois State Medical Society; aged 56; died, October 31, of carcinoma of the stomach.

Albert J. Zinns, Milwaukee; University of Wooster Medical Department, Cleveland, 1878; member of the State Medical Society of Wisconsin; aged 73; died, October 31.

Charles W. Michael, Independence, Ind.; Central College of Physicians and Surgeons, Indianapolis, 1897; aged 59; died, October 22, of cerebral hemorrhage.

Joseph R. Martin, Christiania, Pa.; Jefferson Medical College of Philadelphia, 1862; Civil War veteran; aged 86; died, September 26, at Stewartstown, of senility.

James E. Mayfield, San Antonio, Texas; Medical Department University of Louisiana, New Orleans, 1871; Confederate veteran; aged 81; died, October 23.

Curtis Johnson, Meltonsville, Ala.; University of Tennessee College of Medicine, Memphis, 1911; aged 40; died, October 25, of a self-inflicted bullet wound.

John S. Bradley, Hall, Ind.; Louisville (Ky.) Medical College, 1898; member of the Indiana State Medical Association; aged 49; died, September 19.

Stephen D. Davidson, Reagan, Texas; University of Alabama School of Medicine, Tuscaloosa, 1875; aged 73; died, October 10, of tuberculosis.

Elisha Franklin Dodson, Harriman, Tenn.; University of Louisville (Ky.) School of Medicine, 1882; aged 60; died, September 29, of influenza.

William Lockhart, Lima, Ohio; Long Island College Hospital, Brooklyn, 1880; aged 59; died, October 23, of cerebral hemorrhage.

Alexander F. MacLaren, London, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1865; aged 84; died, September 22.

Emile St. Hilaire, Quebec, Que.; Laval University Faculty of Medicine, Quebec, 1890; aged 58; died, August 12, of arteriosclerosis.

Alva Forman Tod, Philadelphia; Jefferson Medical College of Philadelphia, 1890; aged 62; died, October 23, of pneumonia.

James Polk Thurman, Ingleside, Ga.; Reform Medical College of Georgia, Macon, 1870; aged 73; died, September 27, following a long illness.

Carl Langer ✠ Chicago; Northwestern University Medical School, Chicago, 1892; aged 58; died, October 30, at his home in Palos Park.

Reuben Roy Pickett, Ty Ty, Ga.; University of Georgia Medical Department, Augusta, 1892; aged 55; died, October 22.

James W. Spicer, Acton, Ind.; Cincinnati College of Medicine and Surgery, 1878; aged 71; died, October 22, following a long illness.

Wilson F. Jase, New Orleans; Flint Medical College of New Orleans University, 1902; aged 45; died, October 20, of a self-inflicted wound.

Henry Frederick Hahn, Toledo, Ohio; Toledo Medical College, 1889; aged 58; died, October 26, following a long illness.

Spees W. Duncan, Chamberlain, S. D. (licensed, South Dakota, 1886); aged 73; died suddenly, October 22, of heart disease.

Evan M. Black, Center Point, Ark.; University of Arkansas Medical Department, Little Rock, 1901; aged 63; died in October.

Henry S. Brown, Brighton, Maine; Pulte Medical College, Cincinnati, 1891; aged 65; died, October 19, of cerebral hemorrhage.

Alfred John Knight, Clarkson, Neb.; Jefferson Medical College of Philadelphia, 1906; aged 43; died, September 11.

William T. Thomas, Marion, Ind.; Louisville (Ky.) National Medical College, 1897; aged 55; died, September 6.

Arthur Hosmer Bowen, Westfield, N. Y. (licensed, New York, 1902); aged 91; died, August 5, of arteriosclerosis.

Frank W. Wieland ✠ Dubuque, Iowa; Rush Medical College, Chicago, 1888; aged 68; died suddenly, October 27.

Perin B. Little ✠ Whitestown, Ind.; Medical College of Indiana, Indianapolis, 1895; aged 58; died, August 27.

James Sylvester Antle, Utica, Ill.; Chicago College of Medicine and Surgery, 1911; aged 36; died, Ostober 27.

Reuben Smith, Penfield, Pa.; American Eclectic Medical College, Cincinnati, 1886; aged 82; died, August 23.

William W. Martin, Mayflower, Ark. (licensed, Arkansas, 1903); aged 51; died, October 15.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

GLYEUTHYMENOL NOT ACCEPTED FOR N. N. R.

Report of the Council on Pharmacy and Chemistry

The Council has authorized publication of the following report.

W. A. PUCKNER, Secretary.

Glyeuthymenol, according to Nixon, Stuart & Barker, Peoria, Ill., who market it, "is a scientifically formulated combination of Eucalyptol, Thymol, Menthol, Sodium Benzoate and Zinc Sulphate with a Glycerine base." It is stated

NIXON, STUART & BARKER
MANUFACTURERS OF
GLYEUTHYMENOL
412 Lehmann Bldg.
PEORIA, ILL.

Dear Doctor:

Again we call to your attention, Glyeuthymenol--a vaginal prophylactic.

Hundreds of physicians with whom we have been in personal contact have expressed the opinion that Glyeuthymenol is destined to occupy that immense field now occupied by the vaginal suppository and douche preparations. More than 9,000 others are dispensing it, whose opinions we have not gathered.

Suppositories Impractical—The suppository is not and has never been a practical vehicle. The patient is often careless and does not place it at the cervix. Even if well placed it does not always dissolve. If dissolved its cocoa butter base does not readily unite with mucous secretions. If its dissolving point is high enough to ship in summer heat it is too high to dissolve quickly in the vagina. Glyeuthymenol on the other hand is infallibly delivered at the cervix by means of its applicator (see cut), perfectly dissolved in a glycerine solution. It is ready to instantly unite with vaginal fluid and thus to penetrate the most minute fissures in the vaginal walls. Glycerine, you will remember, is itself inhibitive of protoplastic volitional activity, cocoa butter is not.

The Douche Ineffective—The douche cannot always be effective for protoplast may lurk in microscopic cavities irremovable and untouchable by the douche. While Glyeuthymenol in instant union with mucous fluids must needs penetrate the most infinitisimal fissure there to accomplish its task of prophylaxis. If you accept the hypothesis of contra peristalsis of the uterus in orgasm the douche is doubly ineffective, while Glyeuthymenol will pass into the uterus with protoplast if such be present. If there is contra peristalsis at orgasm Glyeuthymenol would be truly prophylactic against internal uterine Gonorrhoea. Had Glyeuthymenol no other merit than as an agent of the therapeutic cleanliness it would seem to have value in any practice.

Always An Ethical—We assume that many physicians are dispensing Glyeuthymenol in part for economic reasons. They know and resent the fact that suppositories and douche preparations are sold in every drug store and are even articles of merchandise in beauty parlors and department stores, while Glyeuthymenol is a pure ethical. No druggist may buy Glyeuthymenol except that a physician request that we sell him, and if a physician reports a druggist as vending without a prescription we will cut off that druggist's market.

We believe that Glyeuthymenol should be dispensed by the physician but if you must dispense through a druggist you should deliver to him the enclosed card, for his order unaccompanied by the card or a physician's O.K. will not be filled. We, however, strongly suggest your mailing the card yourself.

Yours very truly,
NIXON, STUART & BARKER.

P.S. Our price to patients is only suggested--the physician may make his own prices. The label is detachable.

Photographic reproduction (greatly reduced) of a circular letter sent out by the exploiters of Glyeuthymenol to physicians.

to be composed of thymol 30 grains, menthol 20 grains, eucalyptol 20 minims, synthetic oil of wintergreen 30 minims, Indian gum powder 3½ pounds, sodium benzoate 10 ounces, glycerin 2½ gallons, zinc sulphate 6 ounces and water 7½ gallons.

Glyeuthymenol is to be applied to the cervix by means of a special applicator and, according to the label it is "indicated in Leucorrhea and as a vaginal antiseptic and prophylactic." The advertising designates Glyeuthymenol as a "Vaginal Prophylactic" and stresses its use as a preventive of gonorrhoea and as a contraceptive, thus:

"The douche cannot always be effective for protoplast may lurk in microscopic cavities irremovable and untouchable by the douche. While Glyeuthymenol in instant union with mucous fluids must needs penetrate the most infinitisimal fissure there to accomplish its task of prophylaxis. If you accept the hypothesis of contra peristalsis of the uterus in orgasm the douche is doubly ineffective, while Glyeuthymenol will pass into the uterus with protoplast if such be present. If there is contra peristalsis at orgasm Glyeuthymenol would be truly prophylactic against internal uterine Gonorrhoea."

Glyeuthymenol is an unscientific mixture that is sold with claims which are misleading and unwarranted. Its use is inimical to the public health.

CLEERO

Quackery in Shampoos

"Cleero," which is labeled "the vanishing shampoo" is another piece of cosmetic quackery put out by the Van Ess Laboratories of Chicago. Readers of THE JOURNAL will remember that the Van Ess Laboratories also put out "Van Ess," which was guaranteed to grow hair, and was found by the Association's chemists to consist essentially of kerosene, alcohol and water with a dash of quinin sulphate.

The thesis advanced by the Van Ess Laboratories for the use of Cleero is that the use of soap on the hair is dangerous and that "the free alkali present in most soaps" makes them still worse. Danger, one is told, also lies in the rinsing, for water is said "to devitalize the hair." More than this, the Van Ess concern says that most city water "contains harsh chemicals injected to combat drinking germs" and that these chemicals are very hard on the hair. It would be interesting to learn what the Van Ess Laboratories think these same chemicals, which are said to be injurious to such a hornlike substance as hair, must do to the delicate mucous membrane of the alimentary canal.

The advertising that goes with the trade package of Cleero leads the purchaser to believe, without actually making the definite statement, that Cleero is not a soap. The circular definitely states that "Cleero contains no free alkali." As will be seen later, Cleero is a soap and does contain free alkali.

Of course, Cleero is something new; that is, new to America, the hinterland. The orthodox way of introducing a new humbug to the cosmetic field is to have the thing originate in Europe. One, therefore, is prepared for this statement in the Cleero circular:

"Now from one of the most exclusive beauty parlors of the old Continent, the rendezvous of Europe's most beautiful women, where coiffures are made for the court, comes a new discovery in hair treatment—Cleero."

No claim seems to be too preposterous for the public to swallow in the field of cosmetic quackery. Cleero is recommended for oily hair because it is claimed that it "almost instantly dissolves and removes this excessive natural oil." It is recommended for dry hair because "dry hair absorbs a sufficient portion of the pure vegetable oils in Cleero" to make it oily. It is recommended for white hair because it "intensifies its natural beauty," and it is recommended for dyed hair. "Every physician who knows Cleero endorses its properties and recommends it for home and hospital use." Evidently, Cleero is unknown to the medical profession.

Because of inquiries received, some specimens of Cleero were purchased and one of the bottles turned over to the A. M. A. Chemical Laboratory which reports as follows:

LABORATORY REPORT

"One original bottle of Cleero (Van Ess Laboratories, Chicago) was submitted to the American Medical Association Chemical Laboratory for examination. The bottle contained about four fluid ounces of a pale yellow, perfumed liquid having an odor of ammonia. The liquid had a strongly alkaline reaction to litmus.

"Qualitative tests indicated the presence of a soap having the characteristics of a cocoanut oil soap, free ammonia, an ammonium salt, carbonate, potassium, glycerin and a trace of sodium and of chlorid. The carbonate is evidently present as ammonium carbonate. The potassium is a constituent of the cocoanut oil soap. The perfume probably consists largely of oil of lavender, or an imitation having a lavender-like odor. The amount of glycerin present is approximately ten per cent.

"Heavy metals (such as lead and mercury) and such substances as sodium borate (borax), sucrose (cane sugar), magnesium sulphate, egg albumen, quillaja extractives, calcium salts, quinin and other alkaloids were not found.

"Quantitative analysis of Cleero gave the following:

"Specific Gravity (at 25/25C)	1.040
"Solids on drying	27.86 gm. per 100 c.c.
"Ammonia (NH_3)	1.04 gm. per 100 c.c.
"Potassium (K^+)	2.41 gm. per 100 c.c.
"Fatty acids (from soap)	13.08 gm. per 100 c.c.

"The results of the examination indicate that Cleero is essentially a perfumed, watery solution of soap with free alkali and glycerin having approximately the following composition:

"Cocoanut oil soap	⅓ ounce
"Ammonium carbonate ("hartshorn")	1/10 ounce
"Glycerin	⅓ ounce
"Water	3⅓ ounces"

From the chemists' investigation, it is obvious that Cleero, which is recommended to take the place of soap, is a soap and that the free alkali which is said to be so harmful for the hair is present in Cleero. If a mixture of soap, hartshorn, glycerin and water is the best in the way of new discoveries that "the most exclusive beauty parlors of the old Continent" can produce, the old Continent must be slipping. However, so long as the American public can be persuaded to part with perfectly good money for a very ordinary mixture put out under extraordinary quackish claims, the Van Ess Laboratories will assume that truth in advertising is but a phrase that has merely academic interest.

Correspondence

"SOME FEATURES OF HEATED MILK"

To the Editor:—It is with the deepest appreciation that I read your editorial entitled "Some Features of Heated Milk" (THE JOURNAL, November 1, p. 1434). The American Association of Medical Milk Commissions has always felt that there was a distinct need for some high grade raw milk, and it is generally conceded that the medical profession, through our association, carried the science of bacteriology into the cow stable. We have only striven to make milk better and safer and to furnish the medical profession a high grade basic product.

We have never had any argument as to how it should be used. It may be heated, treated, modified or divided to suit the wishes of the physician, or it may be used raw with a high degree of confidence. It gives the physician his full privileges.

Abundant experience has shown that if the methods and standards for the production of certified milk, adopted by our association, are reasonably carried out, a safe milk results, and from the care now given in the feeding of these cattle, an abundantly rich milk in all known milk essentials. Twenty-five years ago the milk problem was bacterial. Today it is nutritional.

HARRIS MOAK, M.D., Brooklyn.
President, American Association of
Medical Milk Commissions.

CHIROPRACTORS AND INSURANCE COMPANIES

To the Editor:—I am attaching a pamphlet published by the Palmer School of Chiropractic, which lists some of the insurance companies alleged to have recognized chiropractic; among them is the Maryland Casualty Company.

This is grossly false; the Maryland Casualty Company has never recognized chiropractic and never will, so long as the present medical organization exists. It is true that in some instances chiropractors' bills have been paid, where this has been compelled by law, but never, in a single instance, without vigorous protest.

In the workmen's compensation department of this company, the services of a chiropractor are never recognized, and immediate steps are taken, as soon as information is received, to remove our injured employees from the hands of chiropractors to regular licensed physicians. In our personal injury, or accident and health department, we are not thus able to control our cases and frequently are compelled to accept reports sent by chiropractors. Needless to say, these

reports are of no earthly value to us from a scientific standpoint.

The interesting thing about this piece of publicity is the introduction, which merely illustrates the evasive manner in which most of their advertising is carried out.

A. D. Lazenby, M.D., Baltimore.
Chief Surgeon, Maryland
Casualty Company.

"HYGEIA" AND "PHYSICAL CULTURE"

To the Editor:—Some months ago I undertook the treatment of a man, aged 26, suffering from many physical complaints and morbid fears dependent on excessive masturbation, from which he was laboriously but futilely attempting to cure himself with the aid of Bernarr Macfadden's widely advertised book, "Manhood and Marriage." He brought me this strange mixture of fact and fallacy, of which any page chosen at random will show glaring contradictions, vague generalities in regard to essential facts with minute instructions in regard to unessential details, violent exaggerations and gross misstatements. Here and there a well known truth serves to deceive the reader as to the falsity of adjacent assertions.

Recently, when the November number of *Hygeia* arrived, it was placed on my waiting-room table, where this patient discovered the article, "Exploiting the Health Interest," and called my attention to it. On the next visit he remarked to me that he had desired to read other articles in *Hygeia* and had tried several of the largest news stands in New York City but none of the dealers had ever heard of the magazine.

C. P. Oberndorf, M.D., New York.

"MAINTAINING LENGTH AND POSITION IN TREATMENT OF COMPOUND FRACTURES"

To the Editor:—In The Journal, November 1, is a paper with this title by Orr and Thomson, that was read before the Section on Orthopedic Surgery. It advocates and illustrates the correction of deformity in compound fractures by traction through the os calcis. This proposition seemed to have the approval of those who entered into the discussion. Such a presentation should not go to the profession at large without a challenge. The effect of such traction is to bend the foot first and then, when the ankle joint ligaments prevent further flexure, to transmit the power to the tibia and fibula at an angle. Should the ankle joint be immobilized in plaster of Paris, then the power is transmitted directly to the shafts of the leg bones at an angle. The inevitable result is a tilting of the lower fragments posteriorly to the upper. Only in those fractures in which the lower fragment rides anterior to the upper could such a proposition have any justification. Lateral pressure sufficient to overcome such tendency to angulation at the fracture would not be safe, and particularly not in vicious compound fractures. It is primary mechanics that the power should be transmitted in the line of the bone shafts.

H. C. Masland, M.D., Philadelphia.

MOUTH INFECTION IN VARIOUS DISEASES

To the Editor:—Every physician and surgeon presenting clinical reports on diseases of the heart, diseases of the blood vessels, diseases of the blood, disturbances of the thyroid gland, diseases of the kidneys, especially infection of the kidneys, neuritis, joint inflammations, sacro-iliac pain, and mental disturbances should state the condition of the teeth, tonsils and accessory sinuses, as well as the very scientific reports on roentgen-ray examinations, blood examinations, blood pressure examinations, genito-urinary examinations, electrocardiographic examinations and similar studies.

From the point of view of etiologic value, of the results of treatment, of the pathology, and, in fact, from any standpoint, any report that does not declare the absence or the presence of mouth infection is incomplete and has its value greatly diminished.

The neglect of practicing physicians and surgeons in omitting a study of the mouths of their patients is inexcusable. Moreover, the neglect of laboratory experts in not insisting on knowing the condition of the patients' mouths when they are presenting scientific reports on series of cases is regrettable. The profession as a whole should recognize that a clinical examination is incomplete and a clinical report is seriously incomplete without data that will exclude or include focal infection.

Oliver T. Osborne, M.D., New Haven, Conn.

Queries and Minor Notes

Anonymous Communications and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

CAUSES OF VOMITING—VERTIGO

To the Editor:—1. I am writing to ask whether you will kindly give me, as nearly as possible, a classification of the causes of vomiting, and the frequency of the association of vertigo with vomiting. 2. I should like to know, also, whether there is such a condition as "gastric vertigo," and its cause.

B. P. Seward, M.D., Richmond, Va.

Answer.—1. Perhaps the simplest classification of the causes of vomiting is under the two headings centric and peripheral. Under the first heading would be classified direct excitation of the vomiting center (probably the vagus center) from toxemias or increased intracranial tension. While excitation of the vagus nerve in any of its vast ramifications is the most common form of peripheral vomiting, yet it must be admitted that many other nerve stimuli may produce the same result. Thus, seasickness is due to irritation of the nerve endings in the labyrinth; and vomiting after contusion of the testis must be due to injury of afferent sympathetic nerves, as the vagus sends no branches to the testes.

2. As the result, no doubt of the close anatomic relation of the nerve centers responsible for vertigo and vomiting, these symptoms are frequently associated in a great variety of causes, from brain tumors and seasickness to the so-called "gastric vertigo." That there is a vertigo, commonly associated with "gastric upsets," there can be no doubt, though the mechanism of its production is still obscure. It may be toxic in nature; but it is not improbable that it may be, at least at times, due to reflex excitation transmitted along the vagus nerve.

CARE OF EPISIOTOMY WOUND

To the Editor:—In case of an episiotomy wound in confinement that has been stitched with interrupted silkworm-gut sutures, if the knot is accidentally cut so that the loop remains buried in the tissues, is it necessary to cut down and remove it? Would it cause any bad effects from irritation? Would it become disintegrated eventually?

C. C. M., M.D.

Answer.—If a piece of silkworm gut is left in an episiotomy wound that is well healed, it is inadvisable to cut down on the wound to remove the piece of gut. In most instances in which such a mishap has occurred, the suture has come to the surface, where it has been seen or felt and hence readily removed, or it has "worked its way" entirely out of its bed and has never been seen by the patient. Even if the gut remains in situ for many years, it rarely causes trouble. However, a case is known in which, after a piece of silkworm gut had been left in a perineal wound, an abscess formed in a subsequent pregnancy and the patient died of sepsis. As far as is known, silkworm gut left in an episiotomy wound has never been absorbed.

When a piece of nonabsorbable gut is left behind accidentally, it is most advisable (and certainly honest) to tell the patient of the occurrence.

CARBON TETRACHLORID AS AN ANTHELMINTIC

To the Editor:—I have read some notes on the use of carbon tetrachlorid (CCl_4) for the elimination of hookworm, but have not sufficient data to feel safe in using it, and, therefore, I am addressing this letter to you in the hope that you will refer me to some bulletins or periodicals where I can obtain complete data. 1. Will it kill *Taenia* and other worms as well as hookworm? 2. What is the dosage? 3. What dangerous symptoms have been noted in its application?

F. W. SMITH, M.D., Guasave Sinaloa, Mexico.

ANSWER.—1. Carbon tetrachlorid is of no use in eliminating *Taenia*, of little value for *Trichuris*, and fairly efficient for *Ascaris* and *Oxyuris*.

2. The dose for hookworm is 0.1 c.c. for each year up to 15 years of age. The adult dose is from 2 to 3 c.c. The drug should not be given with fats, oils or alcohol, as these substances increase the absorption of carbon tetrachlorid, or the susceptibility to it. The drug may be given in one-third glass of water or given with a solution of Epsom salt. If a saline cathartic is not given with the dose, it should be given within one to two hours afterward.

3. Toxic symptoms described following the use of carbon tetrachlorid are: vomiting, diarrhea, jaundice, convulsions and dyspnea. Several deaths have been reported. Necropsies performed on patients dying in the first few days after the use of the drug have shown central necrosis of the liver and necrosis of suprarenal cells. It is important to use only carbon tetrachlorid medicinal-N. N. R. The following brands are described in New and Nonofficial Remedies, 1924: carbon tetrachloride medicinal-M. C. W.; carbon tetrachloride (human use)-P. D. & Co.; carbon tetrachloride-C. P. (P. W. R.).

The following references will be of interest:

Phelps, B. M., and Hu, C. H.: Carbon Tetrachlorid Poisoning, Report of Two Fatal Cases and Series of Animal Experiments, THE JOURNAL, April 19, 1924, p. 1234.

Bose, J. P., and Mukerji, A. K.: Liver Function Tests and Carbon Tetrachloride, *Indian M. Gaz.* **59**: 127 (March) 1924.

Cadbury, W. W.: Carbon Tetrachloride in Treatment of Uncinariasis, *Am. J. Trop. Med.* **4**: 13 (Jan.) 1924.

Sawyer, W. A., and Sweet, W. C.: Comparison of Certain Methods of Treatment and Diagnosis of Hookworm Infection, *Arch. Int. Med.* **33**: 35 (Jan.) 1924.

Hall, M. C., and Shillinger, J. E.: Effect of Magnesium Sulphate, Simultaneously Administered, on Efficacy and Safety of Carbon Tetrachlorid for Removal of Hookworms, *Am. J. Trop. Med.* **4**: 1 (Jan.) 1924.

INTESTINAL INFLUENZA

To the Editor:—To settle a discussion at a hospital staff meeting, I am directed to write you the following questions: 1. Is intestinal influenza recognized as an entity separate and distinct from respiratory influenza? 2. What is its pathology? 3. What are its symptoms (is constipation or diarrhea present)?

R. O. PAYNE, M.D., Ontario, Ore.

ANSWER.—1. Yes.

2. The condition varies from a mild gastro-enteritis to extensive engorgement of the mucosa with hemorrhages and even ulceration. Swelling of Peyer's patches and mesenteric lymph glands has been observed.

3. The symptoms vary from simple dyspepsia, gastric irritation with nausea and vomiting, and intestinal irritation with colic and diarrhea, to those in the rarer cases in which blood may be vomited, or bloody diarrhea may occur.

PREPARATION OF CHLORIN

To the Editor:—Are there any by-products in the making of chlorin by addition of chemically pure hydrochloric acid to chemically pure potassium permanganate which would prevent the use of the gas in the treatment of respiratory diseases after the manner of use of chlorin gas by Vedder and Sawyer (THE JOURNAL, March 8, p. 764)? In replying, please do not use my name.

M.D., Mississippi.

ANSWER.—There should be no by-products that would prevent the use of the gas in respiratory diseases in preparing chlorin by the addition of chemically pure hydrochloric acid to chemically pure potassium permanganate. The gas should be washed with water to remove hydrogen chlorid.

SERUM REACTION FOLLOWING DIPHTHERIA ANTITOXIN

To the Editor:—I recently gave three children antidiphtheric serum, 10,000 units each. I afterward learned that these children had been given antitoxin two years previously. A few days after the antitoxin had been administered, each child developed cervical, axillary and inguinal lymphadenitis, which was followed by very extensive skin eruption. I was not surprised at the skin eruption, but should like to know whether or not the lymphatic involvement is to be expected.

C. J. BARKER, M.D., Kaw City, Okla.

ANSWER.—Some enlargement of the lymph glands is recognized as one of the signs of serum reaction.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

DELAWARE: Wilmington, Dec. 9-11. Sec., Dr. H. W. Briggs, 1026 Jackson St., Wilmington.

KENTUCKY: Louisville, Dec. 9. Sec., Dr. A. T. McCormack, State Board of Health Bldg., Louisville.

MARYLAND: Baltimore, Dec. 9-12. Sec., Dr. Henry M. Fitzhugh, 1211 Cathedral St., Baltimore.

NEBRASKA: Lincoln, Nov. 18-20. Supt., Dr. J. D. Case, State House, Lincoln.

OHIO: Columbus, Dec. 10-12. Sec., Dr. H. M. Platter, Hartman Hotel Bldg., Columbus.

TEXAS: Dallas, Nov. 18-20. Sec., Dr. T. J. Crowe, 918-19 Mercantile Bank Bldg., Dallas.

VIRGINIA: Richmond, Dec. 9-12. Sec., Dr. J. W. Preston, 720 Anchor Bldg., Roanoke.

THE TRAINING OF MEDICAL STUDENTS

M. S. WOOLF, M.D.
Instructor of Surgery, University of California Medical School
SAN FRANCISCO

In the last twenty years there has been a progressive rise in the standard of medical education in America owing to the gradual elimination of those schools which failed to provide adequate facilities for instruction. A certain number of years are now very generally recognized as the minimum necessary to equip a student for the practice of medicine; and there is no question but that many evils accruing from hurried and inexperienced instruction have been overcome through the change. This means that there has been a standardization of medical training, whereby colleges and universities have been brought under control, so that the public is protected and the student regulated under clearly defined standard policies in medical matters. There is, however, much to be done within the individual centers for the improvement of teaching; or, not so much improvement as alteration in the values placed on certain phases of the curriculum. The total time allotted to the study of medicine is now determined. Let us say it is adequate, in all reason, for the training of a medical practitioner.

With the increase in the number of individuals engaged in the practice of clinical and experimental medicine, a vast array of theories, and methods founded on them, have accumulated. This has brought in its train a subdivision of activities or specialization. Much of this subdivision has been due largely to the facilities of publication of immature research. Medicine, surgery and obstetrics have been, thus, fragmented so that we have our numerous specialities in each of these fields. It is precisely this fact that is making medical education a difficult problem. There has been a liberalism shown toward the practice of medicine, but a stubborn conservatism evinced toward welding the various branches into a respectable unit for teaching purposes.

Assuming that medicine is a subject of immense proportions, and that great necessary or unnecessary additions are made to our library each year, it follows that it may be possible to give to the student of medicine only the framework on which independent thought and action can rest. This framework must be basic, and there are certain significant subjects which must be adequately known. They are anatomy, physiology, biochemistry and pathology (including bacteriology). Anatomy, physiology and biochemistry are well studied before the clinical period; whereas pathology, that is, pathologic anatomy and bacteriology, from its nature, concerns morbid processes and must be taught in conjunction with clinical medicine. These three subjects, then, must definitely be classed as preclinical. They must be absorbed by rigid and studious intent, and they are of such profound importance in future clinical appreciation that they cannot

be absorbed in less than two years. Doubtlessly, they may be covered in less time, as a book is read from cover to cover, but that is not enough. Anatomy, physiology and biochemistry cannot be learned in six months, not even in a year, for anatomy is still the surgeon's Bible. Surgery became possible in medical history only after centuries of anatomic investigation. Knowledge of structure in medical students of the present day comprises only the localities reached by the knife. Moreover, there is a great possibility that, on account of the lack of anatomic instruction, various clinical subjects will be avoided because there is no background for an understanding. Such is the case in the study of diseases of the nervous system. The anatomy of this region is, most often, poorly known. It is impossible, therefore, to keep pace with neurologic diagnosis. The student shirks the responsibility, and graduates with a very perfunctory knowledge of this intricate but fascinating subject.

The reasons for the mode of spread of growths by lymphatic and blood vascular drainage, the methods employed to remedy congenital deformities on the basis of a natural development, the displacements due to fractures and their proper care are examples of the value of correct anatomic knowledge. The manifold surgical approaches to diseased areas, each one of which has often its place, cannot be appreciated except with an anatomic training and, further, new ones cannot be devised or invented for a particularly embarrassing and unexpected pathologic condition.

Physiology and biochemistry are no less significant as part of the great tripod that supports medical education. Clinical medicine merely continues these subjects and applies them, while it strips them of their more academic aspects. We forget that examination of the urine is a physiologic problem. We ignore the fact that the secretion and excretion of urine are physiologic and biochemical. The heart has assumed a different character since we have had the knowledge of its physiologic rhythm, while variations, indicated by the electrocardiograph, can be understood only by a reference to physiologic data. Shock is diagnosed by a direct consideration of the normal production of blood pressure and its maintenance, and of the circulatory changes involved in the deviations from the normal. It is treated on a biochemical and physiologic knowledge of the effect of alterations on physical environment and in the character of the fluid introduced into the vascular system. Roentgenologic interpretation of pathologic changes in the intestine is useless without a correct evaluation of normality.

There are no less well defined pivots of training when one comes in contact with the study of disease. Here pathology, comprising morbid anatomy and bacteriology, internal medicine, surgery and obstetrics are the primary divisions. It is manifestly absurd, as far as the instruction of the student is concerned, to separate surgical pathology from medical pathology, pediatrics from adult medicine, and gynecology from general surgery. Far less is it necessary to distinguish endocrinology and gastro-enterology from the broader consideration of medical problems. From the point of view of general practice, orthopedic surgery is general surgery; and neurosurgery has become a subdivision of the latter only on account of the ignorance of the general surgeon of the anatomy of the nervous system.

There are only a few years in which to put before students the means for grappling with a multitudinous mass of facts. Let us then avoid, as much as possible, theories and devote ourselves to the implantation of universally established principles, for, ultimately, these will determine successful or unsuccessful practice, and reputable theories will be examined later to be retained or discarded. The clinical period of instruction is thus to consist of the unfolding of broad principles in the four significant departments enumerated above. The time will be short even for this, and only expert teachers can be expected to present these subjects with the emphasis and perspective that experience and acuity give. Today, there is a peculiar misunderstanding of the value of the presentation or form of instructional material. Instruction is often left to the inexperienced, the young instructor, who often has not even the virtue of enthusiasm. Because students are beginning their subject, are ignorant of the significance of things and have to be taught elementary facts, it is assumed that an immature teacher is all that is required to give the necessary instruction. This point of view is neither economical nor logical. The more fundamental and vital the subject, the more important is the early molding of the intellect in its essentials. The principles of medicine, surgery, obstetrics and pathology must, therefore, remain in the hands of the most experienced and profound of the staff. We have been rather inclined to imagine that our clinics and lecture rooms create a halo about the personality of a lecturer, so that within their doors he possesses the unqualified and considerable attributes that are demanded in imparting knowledge. Often without due respect to the type of individual employed, numbers of teachers have been gathered to fill the hours required by an overloaded and detailed program of instruction. A fact that adds uncompromisingly to the danger mentioned is the attitude of the teacher to the whole subject of education. If his connection with the school is not considered permanent, either by himself or by the institution, his interests become personal and his teaching perfunctory. These matters not only apply to the wards and outpatient department, but also are of profound importance in the laboratory. Material for experiments must be at hand, and capable supervision is essential.

If one is convinced of the accuracy of the two premises herewith set forth; first, that fundamental essentials are of paramount consideration in the teaching of medical students, and, second: that the allotted period for such teaching, which is now generally adopted, is all too little, one must conclude that there is no time for digressions during the medical course. Endeavoring to teach the "specialties," as such, will be found to contradict any effort in the direction of a simplified and firm foundation for a medical education. But an error equally grave is to absorb valuable time in repeated tests for examination of progress. Uprooting a plant periodically to see how firm are its foundations is a futile and ridiculous proceeding. Time is wasted and the energy of both instructor and student dissipated in trivialities. The latter needs leisure, tranquillity, even mental rest so that any value of a half day's vacation in the middle of the week must not be offset by the disturbance created by an ordeal occurring a few days later.

A digression from the strict line of basic instruction, for which a case is here being presented, is seen in the endeavor to drive students into research. Not only is time unavailable, if we consider we are training men to practice medicine, but the value of research in any practical problem in medicine depends on some amount of knowledge of medicine. At no stage in a student's undergraduate career is such a knowledge great enough to warrant an incursion into the realm of theory. No doubt there will be something printed if certain investigations are done, but they will have been made without the vision natural to those more versed in experimental and in clinical medicine. It has already been said that too much is written, and it would be a wise proceeding to postpone this part of the subject, which, indeed, is important. Even later, it should be a matter of selection for that type of individual who is so inclined. Research in medicine in relation to the medical curriculum can be considered only as an extreme specialization. For those who feel that their inclinations tend toward research, every encouragement

should be given when the medical course is finished. At such a time as much guidance should be given as is offered in other fields; that is, men of considerable experience and work in fields of research should supervise the initial efforts in a difficult and often discouraging activity.

In conclusion, there is the consideration of the health of the medical student. During his undergraduate years he is subject to a strain, both mental and physical, which is not infrequently too much for him. For this reason, too, it is urged that all side issues be avoided and that his labors be directed economically toward the end in view, which is to make him a sound, thoughtful and vigorous physician. The most certain way to accomplish this is to choose teachers according to their earnestness and capability; to free the curriculum from nonessentials, and rely on fundamental principles; to allow the student as much liberty of mind and body as is possible; and, lastly, to remove that overfond maternal supervision which is out of place in university education.

240 Stockton Street.

Montana April Examination

Dr. S. A. Cooney, secretary, Montana Board of Medical Examiners, reports the written examination held at Helena, April 1-3, 1924. The examination covered 10 subjects and included 50 questions. An average of 75 per cent. was required to pass. Of the 8 candidates examined, 7 passed and 1 failed. Three candidates were licensed by reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Northwestern University		(1924)	80.5
University of Illinois		(1914)	79.5
State University of Iowa College of Medicine		(1910)	79.1
Harvard University		(1916)	82.8
Washington University		(1916) 85.3, (1923)	86.5
University of Virginia		(1920)	85.9

College	FAILED	Year Grad.	Per Cent.
Montreal School of Medicine and Surgery		(1901)	68

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Georgetown University		(1903)	Washington
Chicago Homeopathic Medical College		(1904)	Idaho
Northwestern University		(1902)	Alabama

Florida June Examination

Dr. William M. Rowlett, secretary, Florida Board of Medical Examiners, reports the written examination held at Ocala, June 16-17, 1924. The examination covered 10 subjects and included 100 questions. An average of 75 per cent. was required to pass. Of the 94 candidates examined, 76 passed and 18 failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
University of Alabama		(1913) 82.8, (1914)	77.4
Georgetown University		(1922)	85
George Washington University		(1905)	81.7
Atlanta College of Physicians and Surgeons		(1913)	79.1
Emory University		(1915) 78.4, (1917, 2) 80.6, (1918) 78.4, (1921) 79.6, (1922) 79, (1923, 2) 75, 82.4, (1924, 13) 77.5, 78.3, 78.4, 79.8, 80.1, 80.9, 81.5, 83, 84.6, 85, 85.4, 85.9, 87.1	83.5,
University of Georgia		(1919) 79.3, (1920) (1923, 3) 77.5, 79.1, 80.4	85.1,
Hahnemann Medical College and Hospital, Chicago		(1902)	75.6
Northwestern University		(1923)	75.8
University of Louisville		(1893) 79.1, (1907)	80.5
Johns Hopkins University		(1911)	80.4
University of Maryland		(1900) 75.5, (1905) 81.6, (1911)	82.2
Lincoln Medical College		(1911)	77.5
Bellevue Hospital Medical College		(1895)	75
College of Physicians and Surgeons in the City of New York		(1882) 76.3, (1895)	84.3
Cornell University		(1899, 2) 85.1,	85.1
University of the City of New York		(1895)	75
North Carolina Medical College		(1905) 80.4, (1913)	78.4
Cleveland Homeopathic Medical College		(1899)	86.3
Eclectic Med. Inst., Cincinnati		(1880) 79.2, (1897) 75, (1907)	83.6
University of Cincinnati		(1915)	77.1
Hahnemann Medical College and Hospital of Philadelphia		(1904) 80.1, (1907)	75.1
Medico-Chirurgical College of Philadelphia		(1906)	75.4
Temple University		(1908)	80.6
University of Pennsylvania		(1910) 78.6, (1912) 82.7, (1921)	82.8
University of Pittsburgh		(1912)	83.2
Medical College of the State of South Carolina		(1922) (1924, 3) 79.8, 80.1, 81.2	82.4,
Meharry Medical College		(1923)	81.2
Memphis Hospital Medical College		(1913)	80.7
University of Tennessee		(1920)	80.6
Vanderbilt University		(1917) 83.2, (1920) 77.3, (1923)	78
Queen's University Faculty of Medicine		(1891)	75
University of Toronto Faculty of Medicine		(1914)	82
University of Havana, Cuba		(1920)* 81.2, (1923)*	75.2
University of San Salvador, San Salvador		(1918)*	81.9

College	FAILED	Year Grad.	Per Cent.
Emory University		(1917)	72.9
University of Georgia		(1900)	70
College of Med. and Surg. (Physio-Medical), Chicago		(1902)	60.7
College of Physicians and Surgeons, Chicago		(1902)	73.8
Medical College of Indiana		(1897)	74
Kentucky School of Medicine		(1889)	73.9
Louisville and Hospital Medical College		(1908)	73.9
College of Physicians and Surgeons, Boston		(1903)	71.1
Kansas City Medical College		(1905)	73.3
Long Island College Hospital		(1899)	63.4
University of the City of New York		(1895)	69
Medical College of Ohio		(1903)	19.9
Jefferson Medical College		(1888)	65.2
Memphis Hospital Medical College		(1908)	65.7
University of Nashville		(1905)	72.2
University of the South		(1901)	67.8
University of Vermont		(1899)	72.4
University of Kharkov, Russia		(1905)*	62.4

* Graduation not verified.

Book Notices

THE AMERICAN PUBLIC LIBRARY AND THE DIFFUSION OF KNOWLEDGE. By William S. Learned, of the Staff of the Carnegie Foundation for the Advancement of Teaching. Boards. Pp. 89. New York: Harcourt, Brace & Co., 1924.

Librarians are facing today a problem similar to that which confronted the medical profession a quarter of a century ago; namely, the improvement of their professional status by the establishment of standards of education and possibly of licensure. Although differences of situation are numerous, the librarians have requested and received helpful advice based on the early experiences of the American Medical Association in the standardization of medical schools. One expression of the broad program of the American Library Association is Dr. Learned's report to the Carnegie Corporation. His analysis of methods of adult education will arouse the interest of the many physicians now pondering the need of postgraduate teaching for physicians in small urban and in rural areas. Dr. Learned foresees an intelligent and highly specialized educational service, adapted to the capabilities of the adult, wherever situated, and presenting him with the information which he needs and desires. He surveys the scattered outcroppings of such a formation, and indicates advantageous sites for future borings. Among his examples of agencies, outside the library field, that have directed energy wisely, are the American Society for the Control of Cancer, and the American Child Health Association. He comments favorably on THE JOURNAL'S abstracts of current medical literature, and here he errs in a small way, since he describes this as a monthly survey of medical progress, whereas it appears weekly. Dr. Learned's attempt to grapple with the whole problem of adult education merits the attention of educators in all fields.

ANAPHYLAXIS AND SENSITISATION. With Special Reference to the Skin and Its Diseases. By R. Cranston Low, M.D., F.R.C.P., Lecturer on Dis ases of the Skin, Edinburgh University. Cloth. Price, 25 shillings net. Pp. 384, with 22 illustrations. Edinburgh: W. Green & Son, Ltd., 1924.

A thesis presented for the M.D. degree at the University of Edinburgh, and awarded a gold medal, is the basis of this volume. The findings of leading investigators of all countries are presented compactly, simply and in logical sequence. The phenomena of hypersensitiveness are first reviewed. The anaphylactic aspects of urticaria, drug eruptions, the erethemas, purpura, the tuberculids, dermatomycoses and numerous

other skin diseases are pointed out, together with a critical estimate of the results of treatment based on the anaphylactic view of their etiology. Sensitization in tuberculosis receives careful attention. The history of specific tests in syphilis, pregnancy, typhoid and other conditions is related. The authority for each statement is plainly cited, and the subject is summarized succinctly. A few cases of the author's are cited in the discussion of nonspecific therapy. No attempt is made to describe the appearance of various familiar eruptions, but excellent colored plates illustrate the skin reactions and a few of the dermatoses referred to. The extensive bibliography is classified according to the major divisions of the book. The index is fairly complete.

Psychotherapie. Charakterlehre, Psychoanalyse, Hypnose, Psychagogik. Von Arthur Kronfeld, Dr. Med. et Phil. in Berlin. Paper. Price, $2.20. Pp. 260. Berlin: Julius Springer, 1924.

In the brief space of this book, the author has attempted the immense task of developing a systematic outline of the foundations and methods of psychotherapy, with the indications and contraindications for their application. In the first part is given an analysis of personality and character, and the effort is made to systematize by correlating with bodily constitution and with various factors in life and experience in the world outside the body. In the second part, after a discussion of the purpose of psychotherapy and the tools with which the physician must work, there follows a brief account of the methods of persuasion, psychanalysis, hypnosis and suggestion, and finally a chapter on education. Systematic formulations in this way are a step in the right direction, though our actual knowledge is still very incomplete. The author takes a good deal for granted that is still open to question, but his purpose is to lay a foundation for bringing some scientific method into this somewhat nebulous field. Viewed in this light, the book is distinctly worth while, especially when consideration is given to the vast extent and growing realization of the importance of the subject.

Especialidades Enfermedades Venéreas y Cutáneas. Enfermedades Venereas. Por el Prof. Dr. Riecke, Director de la Clinica de Enfermedades Cutáneas de la Universidad de Göttinguen. Enfermedades de la Piel. Por el Prof. Dr. Bettmann, Director de la Clinica de Enfermedades Cutáneas de la Universidad de Heidelberg. Cloth. Pp. 383, with 29 illustrations. Barcelona: Manuel Marín, 1923.

This volume of the Schwalbe series on diagnostic and therapeutic errors comprises two parts—one devoted to venereal diseases and another to skin conditions. Both are as practical and brief as other volumes of the collection to which we have referred in praise. They will repay reading, and Spanish physicians should congratulate themselves on the enterprise of the publishers in having these books translated. The Spanish transcriber, by the way, has fallen into the curious error of translating "Geheimrat" as "secret" adviser.

The Diagnosis of Nervous Diseases. By Sir James Purves-Stewart, K.C.M.G., C.B., M.D., Senior Physician to the Westminister Hospital. Sixth edition. Cloth. Price, $10. Pp. 648, with 285 illustrations. New York: E. B. Treat & Co., 1924.

The popularity of this work is attested by the appearance of its sixth edition, and by its translation into French, German, Spanish and Arabic. Every chapter has been revised for this edition, with the exception of those on war neuroses and war injuries, which have been omitted. A chapter on delirium has been added, and that on psychoneuroses has been completely rewritten. This is not a textbook, but a clinical study with the necessary anatomic and physiologic bases.

Embarazo Extrauterino. Por el Dr. J. Torre Blanco, de la Casa de Maternidad de Madrid. Con un Prólogo del Prof. Sebastián Recasens. Paper. Price, 8 ptas. Pp. 179, with 12 illustrations. Madrid: Paracelso, 1923.

All phases of ectopic pregnancy are discussed in this manual, from etiology—still very much in doubt—to the more practical points of diagnosis and treatment. The text is well up to date and logically arranged, and the author has reviewed not only his own material at the Madrid Maternity, but Spanish and foreign literature.

Miscellany

REPORT ON PLAGUE IN EGYPT

Epidemic plague is present in some part of Egypt during most months of the year. When receding in upper Egypt, it is gaining ground in the delta, each district being a source of infection for the other. From 1142, when the first epidemic in Cairo was recorded, to 1841, as pointed out in a plague report just issued from the public health laboratories in Cairo, twenty-five notable outbreaks of plague occurred. Plague then disappeared from Egypt for fifty-five years, reappearing in Alexandria in 1899. In 1900, cases were reported from Port Said, Damietta and ports of the delta, and in 1901 from upper Egypt in two small outbreaks. Since 1902, when plague became widespread in the delta and definitely infiltrated upper Egypt, there has been a general dispersion throughout the country. In the report of investigation by the department of health of Egypt, the weather is said to be the decisive factor that governs the recurrence and temporary disappearance of the disease. The maximum prevalence for southern Egypt is in March and April; for northern Egypt, May; for the delta, June, and for the northern ports, July. The extent of plague at any moment in the epidemic period, the investigators believe, depends on the weather that prevails about six weeks before, the intervening period being required for rat fleas to develop. The season when fleas are most numerous on rats is the season of greatest incidence of rat and human plague.

Plague is not so widespread in Egypt today or so intense as of old. The number of cases in the twenty year period 1899-1919 has been exceeded in one year in the city of Bombay. The relative exemption of Egypt is not due to a scarcity of rat fleas, it appears, but to a high average immunity of the Egyptian rat through inheritance from survivors of the continuous epizootics of the seventeenth and eighteenth centuries. For 243 years, plague was scarcely ever absent from the country. Cairo had its last great epidemic in 1835, and at present is relatively immune. The scarcity of rats in that city is probably associated with the construction of stone buildings and the commonness of weasels in native houses.

Bubonic plague may become extinct in a country without any obvious reason. It disappeared from Egypt in 1844, and from India in the seventeenth century. The fundamental cause probably can be traced to an increased immunity in the rat population following a long succession of epidemics of plague. While this has occurred in Egypt, it is impossible to predict, the authors believe, the future of plague in Egypt, where conditions seem so favorable for its continuance. It is equally difficult to explain its fluctuations from year to year.

There is a decided tendency in upper Egypt to the pneumonic type of plague. Eighty-three outbreaks of pneumonic plague occurred in the provinces of Qena and Girga from 1899 to 1913, mostly during the bubonic plague season when the weather was hot and dry. These outbreaks remained isolated, and the number of cases was small in contrast to the epidemics of pneumonic plague in Manchuria with 50,000 deaths, and in Mongolia with 15,000 deaths.

Two types of pneumonic plague occur in Egypt, pure and mixed. Pure outbreaks originate from a primary pneumonic case or from a bubonic patient who has secondary plague pneumonia. They are not accompanied by buboes and are not directly related to rats. The authors believe that the conversion of a bubonic outbreak into a pure epidemic of the pneumonic type is governed by changes in the weather, and that patients who travel while ill are much more susceptible to secondary plague pneumonia. Infective thrombi become detached by the exertion of travel, and when swept into the circulation infect the lungs. Gotschlich noted that patients with cervical buboes are especially liable to secondary plague pneumonia.

The greatest prevalence of pneumonic plague in Egypt is coincident with the hottest and dryest time of the year. The unusual degree of susceptibility of people in Qena and Girga

is heightened by the exceptional aridity which prevails in those provinces in the plague season.

Trapping, the construction of rat-proof houses, the disinfection of houses with chemicals and the use of flea-killing agents, all have some bearing on the prevalence of plague in a district; but the most urgent necessity in the prevention of plague in Egypt is a system of national education to teach sanitation.

A SURVEY OF SCHOOLS FOR THE DEAF

For more than ten years, educators have been attempting to secure a thorough survey of the efficiency of schools for the deaf. In 1914 a special committee was appointed at the conference of superintendents and principals of American schools for the deaf, which met in conjunction with the convention of American instructors of the deaf in Staunton, Va. This committee conducted a great deal of research, holding sessions from time to time in various cities, on which occasions schools in the respective centers were examined, and experts in psychology and education were invited to attend. In addition, at the request of this committee, Dr. Rudolph Pintner and Dr. Donald G. Patterson, both of Ohio State University, Columbus, made a thorough examination of the pupils of the Indiana, Ohio, Kentucky, Texas and Mount Airy, Pa., schools. The conclusions of this committee were finally submitted in an elaborate report before the eleventh Triennial Conference of Superintendents and Principals at Columbus, Ohio, in 1919. Although thorough, the committee admitted its inability, in view of the magnitude of the problem, to survey schools of the deaf on a comprehensive scale and recommended a more extended investigation by others. In accordance with this recommendation, the National Organization of Educators for the Deaf appointed a special committee to meet during the joint convention of American teachers of the deaf, Mount Airy, Pa., 1920, to consider means of carrying out a general survey. It was decided to appoint an executive committee to approach some well known educational foundation with a view to obtaining funds for this project. These plans were presented to the National Research Council, which agreed to institute an extensive investigation of the education of the deaf. The committee appointed by the National Research Council to take charge of this survey, is composed of:

Vernon Kellogg, chairman of the Division of Educational Relations, National Research Council, Washington, D. C., chairman.

Ludvig Hektoen, chairman of the Division of Medical Sciences, National Research Council, Washington, D. C.

Robert S. Woodworth, chairman of the Division of Anthropology and Psychology, National Research Council, Washington, D. C.

Percival Hall, president Gallaudet College, Washington, D. C., representing the Convention of American Instructors of the Deaf and the Conference of Superintendents and Principals of American Schools for the Deaf.

Charles W. Richardson, Washington, D. C., representing the Permanent Committee of the American Medical Association on the Deaf Child.

A. L. E. Crouter, superintendent, Pennsylvania Institution for the Deaf, Mount Airy, Pa., representing the American Association to Promote the Teaching of Speech to the Deaf, and the executive committee of the Conference of Superintendents and Principals of American Schools for the Deaf.

Rudolph Pintner, professor of educational psychology, Teachers' College, Columbia University, New York.

Funds for this survey have been appropriated by the Laura Spelman Rockefeller Memorial. Prof. Herbert E. Day and Prof. Irving S. Fusfeld have been engaged as field agents to visit schools for the deaf. They will make three trips, spending days at each school, and including as many schools as time permits. The survey will be an attempt to evaluate the various phases of work which American schools for the deaf are striving to accomplish. Among other things, psychologic tests will be applied in a number of schools to establish norms and to determine the relation between natural ability and actual accomplishment among deaf children. An effort will be made by means of the audiometer to determine the degree of residual hearing possessed by pupils and the extent to which this governs classroom procedure. Another aspect of the investigation will be a general medical survey of the deaf pupils in a few cities under the direction of Dr. Charles W. Richardson, Washington, D. C., in an effort to determine conclusions about deafness from the viewpoint of the otologist. An opportunity to amplify certain results of the survey lies in experimental work to be carried on independently by Dr. Robert H. Galt, professor of psychology, Northwestern University. Dr. Galt has obtained a year's leave of absence to work under an arrangement with the National Research Council at the Columbia Institution for the Deaf to determine, if possible, how far deaf persons can be trained to understand speech through the sense of touch alone.

METROPOLITAN HEALTH DEMONSTRATION

The metropolitan health demonstration, to be conducted by the Milbank Memorial Fund in the Bellevue-Yorkville tuberculosis districts in New York is now in the stage of preliminary organization and actual demonstration work may be begun early in 1925. The city commissioner of health and his assistants are cooperating in this undertaking, which has the approval of the mayor. In selecting the Bellevue-Yorkville district for the demonstration, consideration was given to the fairly equal division of the population, Bellevue having about 114,000 and Yorkville 100,000. Of the total population in 1922, about half (102,416) were adults between the ages of 20 and 45 years; 8 per cent. were children under 5, and 15 per cent. were school children; about 50,000 people in the district were 45 years of age and over. According to the *Quarterly Bulletin* of the Milbank Memorial Fund, the death rate of this district (15.24) is one-third higher on the average than in the city at large, while the death rate from nonpulmonary forms of tuberculosis is 69 per cent. higher than the city rate. The density of population in this area is 170 per acre. There is no predominance of any racial group and it is doubtful whether any other district in the city provides more satisfactory clinical facilities. There are more than twenty-five hospitals, dispensaries and public health institutions, including the Bellevue Hospital, the New York Infirmary for Women and Children, Lying-In Hospital, New York Postgraduate Hospital, Flower Hospital, Babies' Hospital and the Skin and Cancer Hospital. Hospital social service is as well developed as in any other section of the city, and the financial heart of New York centering as it now does around Forty-Second Street, gives rise to a dual population, one, a residential, mostly a night and home population, the other, the tremendously large day working population which pours from other parts of the city and suburbs into its offices, stores and factories. These and many other things were considered in the selection of the Bellevue-Yorkville district for the metropolitan health demonstration.

RURAL WORK OF U. S. PUBLIC HEALTH SERVICE

In the year ended June 30, 1924, the U. S. Public Health Service cooperated in demonstration projects in rural health work in seventy-two counties, or districts comparable to counties, in sixteen states. The appropriation for this work is "for special studies of and demonstration work in rural sanitation." In each demonstration, this work is a part of a well rounded program of health activities conducted in cooperation with the state and local health authorities. The whole-time county health officer is given a status of field agent in the U. S. Public Health Service and in some states that of deputy state health officer, permitting all branches of health work in the community to be conducted under the direction of one head. This plan has been followed for five years. The appropriation for this work in the last fiscal year was $50,000. There was expended $43,584.52 for cooperative projects in counties and about $4,500 for administration and supervision of local projects and special studies in rural sanitation. The total expenditures for the support of the seventy-two local health projects was $583,791.73, of which $465,185.09 was provided from state, county and municipal sources. More than $75,000 came from civic sources such as local health associations, local Red Cross chapters and the International Health Board. The investment of federal funds was met therefore with odds of more than twelve to one. A summary of this work in tabular form giving the principal activities, the scope and some of the results in the various localities appears in *Public Health Reports*, October 17.

Medicolegal

Construction of Partnership Agreements

(Kettlekamp et al. v. Watkins et al. (Mont.), 225 Pac. R. 1003)

The Supreme Court of Montana says that the two plaintiffs and the three defendants formed a partnership, January 1, for the practice of medicine and surgery. The partnership agreement provided, among other things, that each partner should contribute an equal amount toward the office equipment; that each should be entitled to a vacation of six weeks during the year without loss of compensation; and that the net proceeds of the business should be distributed according to a prescribed schedule. Two of the defendants had been engaged in the practice of their profession as partners, but their office quarters were inadequate for the five members of the new firm, and additional rooms were rented and extensive equipment installed. The new partnership was carried on until September 13. At that date money had been collected and distributed according to the original agreement, and accounts for services rendered aggregating a large amount were outstanding. Largely, if not entirely, on account of illness, each of the plaintiffs had been absent from the business for more than six weeks, and because of continued illness and the necessity for each of them to be absent for a further considerable period, a second agreement was entered into, September 13, to the effect that the plaintiffs should retain their one-fifth interest [each] in the equipment of the firm; that all accounts due the firm to date should be collected by the defendants, and after the return of the plaintiffs they should again participate in the division of funds on outstanding accounts as per contract on file, it being understood that the time the plaintiffs should be absent should be deducted from the year specified in the contract; it being understood that the plaintiffs should not be absent over three months, and if it was necessary for them to be absent longer new arrangements must be entered into which would be satisfactory to all concerned. The plaintiffs never returned; but, November 15, formally withdrew from the partnership with the consent of the defendants, who continued as partners in the offices which the five had occupied. After the dissolution, November 15, this action was instituted by the plaintiffs to secure an accounting and an adjustment of the partnership affairs.

The contract of September 13 should be construed in the light of the circumstances that surrounded the parties at the time it was entered into; not in the light of later events. It seems manifest to the court that that contract was intended to have, and did have, this effect: The plaintiffs were granted leave of absence for a period not to exceed three months, and the rights of the five partners, so far as they were affected by that leave of absence, were determined in advance. As a consideration for carrying on the business, the defendants were to collect and retain for themselves whatever they could on the accounts outstanding September 13, and were to have all the proceeds of the business during the leave of absence. The consideration to the plaintiffs was that they retained their interest in the equipment, in the outstanding accounts not collected by the defendants, and their position as members of the partnership with the right to return and participate in a going, prosperous business carried on and preserved to them by the skill, ability and attention of the defendants. The contract became effective immediately and served its purpose until terminated by the dissolution of the partnership, November 15. Money and other credits (called liquid assets) on hand, September 13, and not mentioned in the contract, remained partnership property, as did the office equipment and the outstanding accounts not collected by the defendants. The liabilities of the partnership, September 13, were chargeable against the partnership property and against the partners in equal proportions. Besides, the plaintiffs were chargeable with 40 per cent. of the rent of the extra rooms for the remainder of the time leased.

The original partnership agreement contemplated clearly that if any member of the partnership took a vacation for more than six weeks in any one year he should suffer a reduction of income accordingly. The term "vacation" means: an intermission of procedure; a stated interval in a round of duties or employment; freedom or relief from duty. This definition, as applied to the instant case, clearly included absence from the duties of the partnership from any cause. Nor should a different construction be given to the contract because the net proceeds prior to September 13, had been divided without reference to the time that each partner had been absent, as it would seem that it had been intended to make a final division of the profits at the end of the year, and not oftener. The divisions prior to September 13 should be understood as advances.

Fibroid Tumor as Disease Not Common to the Two Sexes

(Riley v. American Nat. Ins. Co. (Ga.), 123 S. E. R. 33)

The Court of Appeals of Georgia, Division No. 1, in affirming a judgment for the defendant, says that this action —brought by one "Georgia Riley"—was on a health and accident insurance policy. On the trial it was agreed in open court by both parties that the only question in issue and to be determined by the court and jury was whether or not a fibroid tumor was a disease or disability covered by the policy. The policy of insurance provided that it did not cover any loss resulting from any disease "not common to both sexes"; and the undisputed evidence was that men cannot have fibroid tumors—that only women can be so afflicted. It followed that the trial court properly directed a verdict in favor of the defendant.

Criminal Responsibility of Alleged Subnormal Narcotic Addict

(People v. Reid (Calif.), 225 Pac. R. 859)

The Supreme Court of California, in affirming a judgment of conviction of the defendant, who was found guilty of murder in the first degree, the jury fixing the penalty at death, says that the crime was committed in a store into which the defendant and a companion had entered, attempting robbery. The defendant interposed the defense of insanity. The sum and substance of the testimony of two medical experts introduced in his behalf was that he was mentally below par. The testimony of those physicians as to what would be the condition of a morphin addict who had no more morphin and had given himself a hypodermic injection of 3 grains of cocain was based solely on the testimony of the defendant that this was what had occurred. His testimony, however, was impeached generally by proof of his former conviction of a felony, and it may well have been that the jury did not believe his testimony concerning his use of narcotics and their effect on him on the day of the killing. It was also to be noted that when one of those physicians was asked a hypothetic question, setting forth the facts of the robbery in detail and including the fact of the taking of the cocain by the defendant, as to whether or not, in his opinion, the defendant knew at the time of the robbery what he was doing, the physician's answer was that he did know. Furthermore, the testimony of eyewitnesses to the killing showed that the defendant had reasoning capacity and was aware of the nature of the act he was committing. In addition to all this there was the admitted flight of the defendant from the scene of the crime, coupled with the further fact that later in the evening when he met the former owner of the hat, which he had dropped in the store, he told him to "watch out," as he had "bumped off" a man. The jury with this evidence before it doubtless came to the conclusion, and correctly, in this court's opinion, that the defendant at the time of the commission of the crime was not so mentally deranged as to come within the protection of the law on the ground of insanity. Besides, it may be said that on the question as to the mental condition of the defendant at the time of the killing there was a substantial conflict in the evidence.

The fact that the defendant was a morphin addict at the time of the killing was not conclusive evidence that he was at that time insane. Where the defense of insanity is interposed, the burden is on the defendant to support that defense

by showing that he was at the time of the commission of the crime so mentally deranged that he was not conscious of the wrongful nature of the act with which he was charged and did not know that it was criminal. When the killing is done in the perpetration of, or attempt to perpetrate, certain felonies, including that of robbery, the act itself is prima facie evidence of premediation, and the crime is made murder in the first degree regardless of whether or not the defendant had the intent in the first instance or at the time of the shooting to kill. In short, whenever one in doing an act with the design of committing a felony takes the life of another, this is murder. The law in such a case superadds the intent to kill to the original intent to commit the felony. The question therefore before the jury was whether or not the defendant at the time of the commission of the crime of robbery was so mentally deranged as not to know that the act of robbing the store was wrongful and criminal.

Society Proceedings

COMING MEETINGS

American Pathological Society, Washington, D. C., Dec. 29-31. Dr. E. B. Krumbhaar, Chestnut Hill, Philadelphia, Secretary.

American Pharmacological Society, Washington, D. C., Dec. 29-31. Dr. E. D. Brown, University of Minnesota, Minneapolis, Secretary.

American Physiological Society, Washington, D. C., Dec. 30-Jan. 1. Dr. Charles W. Greene, University of Missouri, Columbia, Mo., Secretary.

American Society of Biological Chemistry, Washington, D. C., Dec. 29-31. Dr. Victor C. Myers, New York Post-Graduate Medical School, New York, Secretary.

District of Columbia, Medical Society of, Washington, Dec. 3. Dr. C. B. Conklin, Medical Science Building, Washington, Secretary.

Federation of American Societies for Experimental Biology, Washington, D. C., Dec. 29-31. Dr. E. B. Krumbhaar, Chestnut Hill, Philadelphia, Secretary.

Philippine Islands Medical Association, Manila, Dec. 18-20. Dr. I. Concepcion, College of Medicine and Surgery, Manila, Secretary.

Porto Rico, Medical Association of, San Juan, Dec. 13-14. Dr. Ramon M. Suarez, Santurce, Secretary.

Radiological Society of North America, Kansas City, Mo., Dec. 8-12. Dr. M. J. Sandborn, 844 College Ave., Appleton, Wis., Secretary.

Society of American Bacteriologists, Washington, D. C., Dec. 29-31. Dr. J. M. Sherman, Dairy Industry Building, Ithaca, N. Y., Secretary.

Southern Medical Association, New Orleans, La., Nov. 24-27. Mr. C. P. Loranz, Empire Building, Birmingham, Ala., Secretary.

Southern Surgical Association, Charleston, S. C., Dec. 9-11. Dr. H. A. Royster, 423 Fayetteville Street, Raleigh, N. C., Secretary.

Western Surgical Association, French Lick Springs, Dec. 4-6. Dr. Harry P. Ritchie, Lowry Building, St. Paul, Secretary.

JOINT MEETING OF CHICAGO NEUROLOGICAL SOCIETY, CHICAGO ORTHOPEDIC SOCIETY, CHICAGO SURGICAL SOCIETY AND INSTITUTE OF MEDICINE OF CHICAGO

Held, Oct. 30, 1924

DR. CASSIUS D. WESCOTT, President of the Institute, Presiding

Experimental and Clinical Experiences with Sympathectomy in Spastic Paralysis

DRS. ALLEN B. KANAVEL, LEWIS J. POLLOCK and LOYAL E. DAVIS: The relation of the sympathetic nervous system to muscle tone has been investigated from experimental and clinical standpoints. Employing silver impregnation stains, several investigators have shown the presence of nonmyelinated fibers, independent of medullated fibers, which ended in characteristic rings, loops and nets, either within the sarcoplasm of a typical end plate or as small independent end plates in striated muscles. These fibers are described as arising from the thoracolumbar division of the sympathetic system. Assuming that such fibers are present in skeletal muscle, the latter then appear to have a dual innervation from the cerebrospinal and from the sympathetic nervous system.

Two lines of experimental investigation have been followed to determine the effect of removal of the sympathetic system on muscle tonus. First, the sympathetic innervation to an extremity of a normal animal has been removed, and the reflexes, active and passive motion and posture of the limb have been subsequently studied. Second, the effect of sympathectomy on the maintenance and onset of decerebrate ridigity has been investigated. The evidence with reference to the effect of sympathectomy on tone in a normal extremity is equally divided pro and con. All investigators have been agreed that sympathectomy has no effect on the onset or maintenance of decerebrate rigidity.

With the question in this situation, Royle and Hunter reinvestigated the problem experimentally and clinically. Their hypothesis was that: (1) Striated muscle has a dual innervation; (2) muscle tonus may be divided, as Sherrington and Langelaan have stated, into contractile and plastic tone, and (3) the sympathetic system subserves plastic tone. They have sectioned the anterior roots in fowl and have found left a certain posture in the corresponding wing which has later been lost by doing a sympathectomy and which they stated was due to the removal of plastic tone. They have also removed the sympathetic trunk in goats, and after a period sufficient for degeneration to occur have produced decerebrate rigidity. They believe that such a procedure does not affect the onset but does alter the maintenance of decerebrate rigidity. They have operated in many cases of spasticity in man and have removed the sympathetic rami to the spinal nerves. They have reported immediate relaxation of the muscular rigidity. They believe that those cases of spasticity which show increased plastic tone, as evidenced by "hung-up" reflexes and shortening and lengthening reactions, are alone suitable for sympathetic ramisectomy.

We set out to investigate the effect of sympathectomy on muscle tone and to determine what clinical cases, if any, would be benefited by removal of the sympathetic supply. We removed the cervical or abdominal sympathetic trunk from sixteen cats and observed them from two weeks to sixty-three days. Cats have been the animals on which all studies of tone have been made in the past. After periods of time varying as stated above, these animals were decerebrated by the Pollock-Davis method. This consists of ligating the basilar and common carotid arteries. It has many advantages over the older guillotine method in that the level of section is more accurate; the animals may be studied longer and there is less shock, and therefore the usual reflexes are present immediately. We were wholly unable in studying reflexes, gait, and active and passive motion, both by motion picture records and by direct observation, to find any effect on normal muscle tone or to observe any effect on the onset or maintenance of decerebrate rigidity.

Clinically, we chose various types of increased muscle tone to study. We chose (1) that due to paralysis agitans of both the postencephalitic and true types; (2) that due to a degenerative spinal cord lesion, such as lateral sclerosis; (3) that due to a hemiplegia with aphasia, produced by a cortical vascular lesion, and (4) that due to Little's disease. All the patients operated on were quite intelligent and mentally fit. The patients' active and passive muscle movements, tendon reflexes, tremors, direct myotatic irritability and electrical responses were studied by kymographic tracings and electromyographic tracings before and after operation. The gaits, range of motion and resistance to passive movements were recorded both by clinical notes and by motion pictures before and after operation. Gastro-intestinal roentgen-ray studies were made before and after operation to determine the effect of removal of the sympathetic trunk on the movements of the intestinal tract.

Tone is a property of muscle, the components of which are today incompletely known and the physiology of which is poorly understood. There is at present no accurate physiologic method of measuring an increase or decrease in muscle tone. We believe that perhaps four mechanisms may be generally accepted as concerned in hypertonicity: (1) the corticospinal tract; (2) the extrapyramidal system represented largely by the striate body; (3) the brain-stem mechanism, and (4) cerebellar contraction. We believe it highly impossible that any single reflex arc or system mediates all these functions.

We were unable to affect the rigidity or tremor of paralysis agitans of either type, and it is emphasized that paralysis agitans is an example *par excellence* of increased plastic tone. We were unable to affect the rigidity of lateral sclerosis. We

obtained some slight result in one case of cerebral hemiplegia, and to date no demonstrable results in our cases of Little's disease. We removed the cervical and abdominal sympathetic trunks as indicated, of course thereby sectioning all of the rami communicantes. Our abdominal sympathectomies were done by the approach described by Royle and through a midline abdominal incision. We conclude that there may be some effect of sympathectomy on muscle tone probably through a vasomotor or chemical change, but at present there is no method of measuring that result either clinically or in the physiologic laboratory, and the problem should revert again to the physiologist to find a way of accurately measuring changes in muscle tonus.

DR. E. W. RYERSON: The tone of the discussion has been rather unfriendly to the operation. It is greatly to be deplored that this operation was broadcast much too early, before definite observations could be made. I am not exactly convinced that it has been demonstrated that this is not a useful operation. It is unfortunate that the authors did not delineate the indications a little more accurately. Many of these experimental and actual operations were done on patients who were definitely denied the operation by Drs. Royle and Hunter. Paralysis agitans, they stated even before they got here, was entirely unimproved by this operative procedure. The answer was that they are so few in number and the class of cases to be benefited so extremely small, that the operation has a limited amount of interest for the practitioner. Mention has been made of various other operations that have been used with little success. Most of the operative work that has been successful has been the lengthening of tendons. Lengthening of tendons in these cases produces a definite benefit, and almost any type of operation produces a distinct benefit for the reason given by one of the speakers. The patients want to do better, and do improve after almost any kind of operative treatment. Dr. Royle operated in three cases at St. Luke's. One of the patients was one on whom I had performed several tendon lengthening operations previously. The condition that resulted after these operations undoubtedly militated against the success of Dr. Royle's operation, because a similar patient operated on on the same day, with an almost identical condition of the hand, was much benefited. That was the case I saw two days after operation. This girl could supinate the hand. Dr. Davis pointed out that the child could not supinate the hand. Unless these contractures are relieved, it is useless to do the sympathectomy operation. I believe that in properly selected cases—judging from the few I have seen, only three or four in number, and there have been at least a dozen done by Royle here, there is a future in this operation. It is not difficult. It must be pointed out also that the method of approach in the surgical operation by Drs. Davis and Kanavel was not the same as the approach Dr. Royle uses. The abdominal operation by Kanavel and Davis is not identical with the operation employed by Royle. The operators in this city have taken out the entire sympathetic cord, as I understand it. Dr. Royle does not. He simply cuts the small rami.

DR. PHILIP LEWIN: During Dr. Royle's stay here he operated in twelve cases. Seven patients were referred to him by me, and I assisted in the operation of five. Before operation I examined eight or ten, and since operation I have seen ten of the patients. The two that he operated on for Dr. Parker at the Home for Destitute and Crippled Children I saw with Dr. Royle two days later. They were both definitely improved. What I propose to tell is observations that I do not expect to be able to explain. These two patients were both definitely benefited in that all vasomotor tone of the limbs on the side operated on was much improved. The limbs were warmer and dryer. When we asked these children to perform what I call the triple movement test actively and passively, that is, actively flexing and extending the limb three times in succession—or you can do it ten times if you want to—and then do the other leg, both actively and passively, I was convinced that the limbs which were operated on, which, previous to the operation, were the worst limbs, were much less rigid. The child moved them more easily himself, and I moved them more easily. Now, Royle selected the worst limb in every case, if it was a bilateral affair. He said to me that if the worst limb is operated on each time, the next day it will be found to be the better limb. So far as I have observed since, I believe that is true. The reflexes were not greatly altered in those two cases. We went from there to Wesley Hospital and saw two patients that Dr. Royle had operated on about four days before, but did not see much change in them. These two cases were thrown on the screen tonight by Dr. Davis and to me it looks as though they have improved a whole lot. The physicians expect too much from the operation and the people expect too darned much. If it removes a certain block that is present and allows the physician to reeducate the patient or give them what Royle calls neuromuscular education or neuromuscular reeducation and allow that to be carried on at a greater rate, I think it is well worth while. All these patients are enthusiastic or else they would not allow the operation. Therefore, they are enthusiastic in saying they are better. I cannot explain it and I do not know of any one else who can; but I believe that the operation is going to do a lot of good in ways that might never be explained.

DR. A. J. CARLSON: I have had no experience with these cases that have been reported here, but I have some knowledge of the supposed physiologic agents. It is very easy to put up a straw man and then make a great hullabaloo to knock him down. And while it is probable and possible that these various types of spasticities may not easily be paralleled on the experimental animal, yet it seems to me that until we have been able to show that the efferent sympathetics have any influence whatever on skeletal muscles, we really have no ground to stand on. Every criticial experiment undertaken by a critical physiologist is absolutely negative. Of course, there is the possibility of changes in muscle tone following changes in the circulation. If you remove the large sympathetic trunk you may get an effect on the reflex centers. I have seen, for example, in frogs with complete cross-section of the cord that we have had now for four years, that stimulation of the large bowel will put the legs in rigidity which will last from ten to fifteen minutes. We have added evidence from all kinds of animals that the visceral afferents may, and in some cases do, increase the reflex mechanism of the skeletal musculature. That, of course, would be an entirely different affair from a direct cutting off of the sympathetic tone. I am afraid that we physiologists are partly to take the blame for this excursion of the surgeons because of the suggestion by the physiologic experiment that cutting these nerves diminishes tone. Whether they have a scientific mind or not, as Dr. Ryerson brought out, if they had examined all the physiologic evidence I do not believe they would have taken the step.

DR. ERNEST SACHS, St. Louis: I have read Dr. Royle's papers and read the reviews in some of the English journals, particularly one by Dr. Walshe, which is favorable. I felt that the work was not convincing. I have been tremendously impressed by the very careful and accurate methods that Drs. Kanavel, Davis and Pollock have employed in studying these cases, and in trying to find out experimentally first whether there was a sound basis for undertaking these operations. I am going back with a very definite impression that the question is distinctly not proven.

DR. ALLEN B. KANAVEL: Dr. Ryerson did not hear Dr. Davis say that we not only had operated on these patients by abdominal sympathectomy and removal of the cervical, but also did all four types of operation in these patients.

Accidental Deaths from Gas.—The U. S. census reports show that within the registration area of the United States there were 1,778 deaths in 1921 and 2,039 in 1922 from the "absorption of irrespirable irritating or poisonous gas." There were, in addition, suicides by gas, which numbered 1,401 in 1921 and 1,448 in 1922. The most important gas involved is carbon monoxid, which is present in some kinds of illuminating gas, the exhaust from automobiles, fumes from gas stoves, oil heaters, coal furnaces and other fires. The danger is increased at this time of year, because houses, garages and shops are closed and ventilated less in order to keep out the cold.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL for a period of three days. No foreign journals are available prior to 1920, nor domestic prior to 1923. Requests should be accompained by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested).

Titles marked with an asterisk (*) are abstracted below.

American Journal of Hygiene, Baltimore

4: 411-604 (Sept.) 1924

Bacterial Disease of Adult House Flies. R. W. Glaser.—p. 411.
Ancylostoma Braziliense De Faria, 1910; Occurrence in Man and Animals. S. T. Darling.—p. 416.
Mosquitoes of Lee County, Georgia. F. M. Root.—p. 449.
Male Genitalia of American Anopheles. F. M. Root.—p. 456.
*Control of Hookworm Disease. XXXIII. Significance of Egg Count. N. R. Stoll.—p. 466.
Population and Mortality in United States. T. J. LeBlanc.—p. 501.
*Experimental Measles. I. J. M. Scott and C. E. Simon.—p. 559.

Control of Hookworm Disease.—Detailed studies made by Stoll, of the egg production from two individuals infested with *Necator americanus* are presented, covering periods of fifteen and forty consecutive days. These infestations showed an output of 533,900 and 98,220 eggs per day, respectively, as averaged on the entire study periods. In the control of hookworm disease the egg count is important.

Experimental Measles.—Scott and Simon conclude that a sustained rise in temperature with its acme occurring at a certain time, coupled with an amphophilic leukopenia, constitute the most characteristic symptoms of a measles infection in the rabbit, and that with proper controls the thermic and leukocytic responses may well serve as criteria of infection with this virus.

American Journal of Ophthalmology, Chicago

7: 749-828 (Oct.) 1924

Tucking Straight Muscles. H. D. Bruns, New Orleans.—p. 749.
Tumors of Lacrimal Gland. A. B. Bruner, Cleveland.—p. 755.
Epithelial Dystrophy of Cornea. L. B. Whitham, Baltimore.—p. 759.
Central Homonymous Hemianopic Scotoma. E. Stieren, Pittsburgh.—p. 764.
Complete Discission by V Shaped Method. M. Radcliffe, Philadelphia.—p. 766.
Asteroid Hyalitis. H. H. Stark, El Paso.—p. 770.
Sodium Salicylate in Ocular Inflammations. M. Black, Denver.—p. 773.
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Periostitis of Orbit. R. M. Rogers, Brooklyn.—p. 782.
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American Journal of Roentgenology and Radium Therapy, New York

12: 209-300 (Sept.) 1924

Short Wave Roentgen-Ray Therapy. G. W. Holmes and R. Dresser, Boston.—p. 209.
*Roentgen-Ray Treatment of Syringomyelia. A. S. Merrill, Boston.—p. 214.
*Radiation Treatment of Carcinoma of Larynx. H. K. Pancoast, Philadelphia.—p. 217.
Indications for Radium and Other Methods of Treatment in Cancer. W. H. Schmidt, Philadelphia.—p. 219.
Cancerous Ulcers of Stomach Producing Reflex "Duodenal" Derangements Shown by Roentgenograms. A. Galambos, New York City.—p. 230.
Osteopsathyrosis (Osteogenesis Imperfecta). C. R. Scott, New Haven, Conn.—p. 237.
Diverticulosis and Diverticulitis of Colon. C. D. Enfield, Louisville.—p. 242.
*Chronic Stenosis of Duodenum. N. Ratkóczi, Budapest, Hungary.—p. 246.
*Cardiac Area in Man. P. C. Hodges and J. A. E. Eyster, Madison, Wis.—p. 252.

Roentgenotherapy of Syringomyelia. — Nine cases of syringomyelia have been subjected to roentgen-ray treatment in the Massachusetts General Hospital. One case, that of a young woman with very marked symptoms, showed some improvement and apparent arrest of progress after two years. Another case was attended by marked improvement. In this case treatment was begun in October, 1915. Not only did the patient's condition improve considerably but the progress of the disease was stayed. In February, 1924, no subjective nor objective evidence of recurrence was apparent.

Radiotherapy of Laryngeal Carcinoma.—After adequate trial over a period of many years, Pancoast found the results of radiation treatment of laryngeal carcinoma to be very disappointing. He acknowledges the superiority of improved surgical technic in operable cases. He says that radiation may be employed with care as a palliative measure with tracheotomy in inoperable cases, and possibly as a postoperative measure.

Chronic Stenosis of Duodenum.—Chronic duodenal stenoses are divided into two groups by Ratkóczi: (*a*) persistent, and (*b*) intermittent. Causes of persistent stenoses are: (*a*) adhesions after laparotomy, (*b*) adhesions due to tuberculosis and peritonitis, and (*c*) tumors of the stomach, pancreas, etc. Causes of intermittent stenoses are: (*a*) movable tumors, (*b*) pressure of the mesentery or the superior mesenteric artery, (*c*) reflex spasm resulting from a lesion elsewhere in the gastro-intestinal tract. Roentgen-ray examination is diagnostic. Seven cases are cited.

Cardiac Area in Man.—New tables are given by Hodges and Eyster for the estimation of normal cardiac area in man. These are derived from the formula: Area in square centimeters = Age 0.0204 + Stature 0.8668 + Weight 0.337 minus the constant 63.8049. If the heart is found to be 7 sq. cm. larger than the predicted area, the chances are 3 to 1 that it is actually enlarged. With 14 sq. cm., the chances of pathology are 10 to 1 and with 21 sq. cm., 45 to 1.

Annals of Medical History, New York

6: 245-362 (Sept.) 1924

Elisha North and Treatise on Spotted Fever. F. L. Pleadwell, Washington, D. C.—p. 245.
Semmelweis; An Interpretation. P. M. Dawson, Madison, Wis.—p. 258.
History of Phlogiston with Observations on Doctrine of Forms and History of Alchemy. T. L. Davis, Cambridge, Mass.—p. 280.
Letter of Sir Thomas Browne. E. Moschcowitz, New York.—p. 287.
Siamese Twins of Espanola. A. P. Chavarria and P. G. Shipley, Baltimore.—p. 297.
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History of Medicine in Lower Canada. M. Charlton, Montreal.—p. 312.

Archives of Internal Medicine, Chicago

34: 417-584 (Oct.) 1924

*Treatment of Angina Pectoris. P. K. Brown and W. B. Coffey, San Francisco.—p. 417.
*Reaction of Liver to Phenoltetrachlorphthalein in Early Obstructive Jaundice. W. Bloom and W. H. Rosenau, Chicago.—p. 446.
*Mitral Stenosis Without Rheumatic Fever. H. E. Meleney and I. Kellets, Peking, China.—p. 455.
*Concentrating Capacity of Kidney. T. Addis and M. G. Foster, San Francisco.—p. 462.
Length of Life of Unagglutinable Transfused Red Blood Corpuscle. W. Ashby, Rochester, Minn.—p. 481.
Resistance of Leukocytes. J. J. Sampson, San Francisco.—p. 490.
*Increased Blood Uric Acid in Hypertension. A. M. Fishberg, New York.—p. 503.
*Juvenile Diabetic Coma with Insignificant Ketonuria, and with Large Amount of Acetone in Spinal Fluid. H. M. Feinblatt, Brooklyn.—p. 508.
*Hexamethylenamin; Bearing on Systemic Antisepsis. F. De Eds, San Francisco.—p. 511.
Effects of Mitral Stenosis, Pulmonic Stenosis, Aortic Regurgitation and Hypertension on Electrocardiogram. P. D. White, Boston, and C. S. Burwell, Baltimore.—p. 529.
*Liver Function Test. G. D. Delprat; N. N. Epstein and W. J. Kerr, San Francisco.—p. 533.
*Diastatic Activity of Blood; Value in Clinical Diagnosis. I. C. Brill, Portland, Ore.—p. 542.
Basal Pulse Rate and Pulse Pressure Changes Accompanying Variations in Basal Metabolism Rate. J. M. Read, San Francisco.—p. 553.
*Lactic Acid in Arthritis and Rheumatoid Conditions. F. A. Cajori, C. Y. Crouter and R. Pemberton, Philadelphia.—p. 566.
*Metabolism of Obesity. C. C. Wang and S. Strouse and A. D. Saunders, Chicago.—p. 573.

Treatment of Angina Pectoris.—Brown and Coffey report nine cases of angina pectoris in which the operation consisted in removal of the superior ganglion. Of these one patient died as a result of the operation and one two weeks later. The others have been relieved, except one patient and he has been relieved of all but the referred pain and pain due to trauma of operation. The literature is also reviewed. Cutting the left superior cardiac branch of the cervical sympathetic and the main trunk below the ganglion has relieved the main condition in anginal attacks. In a few cases, referred pains are not entirely relieved. The operation performed by the

authors is said to remove the main cause of angina. This is based on the supposition (1) that angina is due primarily to spasm of the aorta but it may be also of the coronaries, for they are supplied by the same nerve systems of the sympathetic. The spasm is most commonly in the aorta but it may occur alone in the coronaries; (2) that the superior cardiac nerve has a constrictor action, and cutting it prevents the spasm. The operation may have to be bilateral completely to relieve all pain. Seven cases in which the authors' operation was performed by others are also cited.

Fate of Phenoltetrachlorphthalein. — The experiments reported on by Bloom and Rosenau were undertaken with the view to determine the fate of phenoltetrachlorphthalein after intravenous injection, immediately after ligation of the common and cystic ducts and to correlate these findings with the results of the Van den Bergh test. The cystic duct was to be tied to prevent excretion of the dye into the gall bladder by the liver. The experiments showed that in the absence of the liver and kidneys the dye remained in the circulation as long as the animals lived. After tying the common and cystic ducts, the liver was able to remove large quantities of phenoltetrachlorphthalein. It is stated by the authors that in the absence of the liver and kidneys, phenoltetrachlorphthalein continued to circulate in the blood stream. The intravenous injection of phenoltetrachlorphthalein in the early stages of obstructive jaundice in dogs caused an earlier appearance of both the indirect and the direct Van den Bergh reactions that was noticed in control animals. All attempts to recover the dye from the liver in obstructive jaundice were unsuccessful. Dog liver decolorized phenoltetrachlorphthalein less than the heart, lung, and spleen in vitro. In early obstructive jaundice, phenoltetrachlorphthalein appeared in minute amounts or not at all in the lymph of the thoracic duct. In chronic obstructive jaundice, however, the dye was present in large amounts in the lymph of the thoracic duct. The intravenous injection of phenoltetrachlorphthalein produced in the human being a transient hyperbilirubinemia, as evidenced by the Van den Bergh test. The high incidence of thromboses and other untoward reactions after the injection of phenoltetrachlorphthalein, is a serious objection to the execution of this test as a clinical method. In no case of long standing complete biliary obstruction have they noticed a greater dye retention than 4 per cent. in the blood serum. A new method is given for the accurate determination of small amounts of phenoltetrachlorphthalein in blood serum.

Mitral Stenosis Without Rheumatic Fever.—Meleney and Kellers report on thirty-nine cases of mitral stenosis occurring in Chinese patients, particularly from the standpoint of their etiologic relationship to rheumatic fever, acute arthritis and chorea, and three conditions which were termed by Duckworth "rheumatic antecedents." Of the thirty-five only one gave a history of rheumatic fever, and one a history of chorea; while fourteen others gave a history of joint pains of varying intensity. No other infectious diseases appear to be especially involved in these cases of mitral stenosis. In sex and age incidence, in electrocardiographic phenomena and in the pathology of three cases which came to necropsy, these cases are similar to the cases of mitral stenosis of rheumatic origin seen in Europe and America. Of the six known deaths in this series three cases came to necropsy. In all of these the diagnosis of mitral stenosis was confirmed.

Concentrating Capacity of Kidney.—Experiments on normal human subjects are reported by Addis and Foster, in which the conditions were adjusted with a view to the production of urine which would contain the highest possible concentration of urea, chlorids and phosphates. It was found that the highest concentration of each of these substances was attained when it was given in considerable amount and in high concentration to subjects whose fluid intake had been restricted. Experiments on rabbits deprived of water and given large amounts of a mixture of urea and sodium chlorid showed that it was possible to obtain urine in which there was a high concentration of both of these substances. No evidence was found which would suggest that the height to which the osmotic pressure of the urine might rise is restricted by virtue of any limitation in renal capacity. The widely accepted hypothesis that the kidney is unable to excrete urea, chlorid or phosphates at more than certain maximum concentrations is shown to be untenable. The assumption that concentrations of urea, chlorid and phosphate, which approach the highest levels found in the urine, have approximately the same osmotic pressure is shown to be contrary to observed facts. It is suggested that changes in the concentration of urea, chlorids and phosphates in the urine are produced by changes in the relation between the concentration of these substances in the blood and the concentration of free water in the blood. It is difficult to obtain very high concentrations of the urine because a marked increase in concentration of urea, chlorid or phosphate in the blood is associated with a concomitant increase in the concentration of free water in the blood.

Blood Uric Acid in Hypertension.—Fishberg studied the uric acid content of the blood in 110 cases of chronic hypertension. All of these cases were of the types ordinarily termed essential hypertension or chronic interstitial nephritis. The observations made indicate that these cases of essential hypertension with high blood uric acid, but normal amounts of urea in the blood, show no tendency to subsequent retension of urea and the parallel development of uremia. The patients followed for varying periods, from a few weeks to three years, did not develop renal insufficiency (except in one questionable instance) but suffered from the direct consequences of the circulatory strain, such as myocardial insufficiency or cerebral hemorrhage, or from some complication, most frequently diabetes mellitus. Anatomic investigation of the kidneys of four patients with high blood uric acid, who succumbed to these extrarenal manifestations, did not indicate that renal insufficiency was present. Despite the high content of the blood in uric acid these cases are "benign" so far as the kidney is concerned, and their chief dangers are cardiac failure or cerebral hemorrhage. Observation of the clinical course of these patients shows that the high blood uric acid does not presage impending renal insufficiency. The uric acid content of the blood fluctuates considerably, apart from diet, and apparently has no prognostic significance. The authors were unable to discern any differences in the symptomatology and course of the cases with hyperuricemia and those with a normal blood uric acid. Like the hyperglycemia so common in hypertension, the increased uric acid content of the blood is due to metabolic causes and not to beginning renal insufficiency. When renal insufficiency sets in, the uric acid level of the blood rises, but it is then accompanied by a rise in the blood urea, which differentiates the hyperuricemia of renal origin from that accompanying hypertension in the presence of intact kidney function.

Juvenile Diabetes with Severe Grade of Acetonuria.—The case reported by Feinblatt is especially unique in (1) the finding of only insignificant ketonuria in spite of extreme acidosis, (2) the presence of a large amount of acetone in the spinal fluid notwithstanding its absence from the blood, and (3) the failure of enormous doses of insulin to influence the blood sugar level.

Hexamethylenamin Not Systemic Antiseptic.—Experiments performed by De Eds indicate that the hexamethylenamin (when given by mouth) unaccounted for by urinary excretion is lost or decomposed in the alimentary tract, chiefly in virtue of gastric acidity, and that there is no rational basis for the use of the drug, orally or intravenously, as a systemic antiseptic in the treatment of various infectious diseases and localized infection.

Rose Bengal Liver Function Test.—Delprat, Epstein and Kerr use rose bengal in their study of liver function as a test medium. In normal persons, following the injection of a given amount of rose bengal into the circulation, the concentration of the dye computed under standard conditions of dosage and blood volume does not exceed certain limits at four and eight minutes after the time of injection. In abnormal cases, where evidence of liver disease can be demonstrated clinically, the concentration of the dye in the circulation computed under standard conditions of dosage and blood volume, at four and eight minutes from the time of injection, exceeds the limits of concentration of the normal cases. Complete biliary obstruction, which can be determined by

other clinical tests, causes a retention of the dye in the blood stream. When it can be shown that the rate of elimination of rose bengal from the circulation, after injection, is reduced, or in other words, when the concentration of the dye at four and eight minutes after injection exceeds the normal limits, a certain degree of liver dysfunction may be assumed to exist in the absence of complete biliary obstruction. A rough estimate can be formed from the concentration of the dye remaining in the circulation at four and eight minutes after injection of the extent of the liver disease.

Diastatic Activity of Blood.—Estimation of the diastatic activity of the blood, as determined by the method of Myers and Killian, Brill says, yielded no information of clinical value in the cases of diabetes and in the one case of pancreatic carcinoma studied.

Lactic Acid in Arthritis.—The lactic acid contents of the blood, urine and sweat of patients suffering from arthritis and rheumatic disabilities was determined by Wang, Strouse and Saunders and the results have been compared with the respective lactic acid contents from nonarthritic persons. The lactic acid was determined also in the synovial fluid from a case of joint effusion. In no case have they observed abnormal quantities of lactic acid in the arthritic patients. These findings therefore lend no support to the idea that arthritis, at least of the types studied, is caused or characterized by abnormal production or disposal of lactic acid. Lactic acid has been found to be present in sweat in considerable quantities, making up about 50 per cent. of the organic acids of sweat. Its presence in this secretion may be referable to the chemical changes occurring in the sweat glands during their activity. The benefit accuring to arthritic patients from sweating measures cannot, in the light of these results, be ascribed to the elimination of lactic acid in the sweat.

Metabolism of Obesity.—Twenty-six tests were made by Wang, Strouse and Saunders, on twelve obese subjects, using protein, carbohydrate and fat meals; eleven tests on five thin people, and twelve tests on five normal subjects. Protein showed a very slight specific dynamic action in obese people. Thin people, on the contrary, showed a very high specific dynamic action of protein. Normal subjects followed much the same course as the thin people, but to a less degree. Normal subjects had the most marked specific dynamic action of carbohydrate. Although obese persons did not react in a uniform manner to carbohydrate intake the average for the group indicated a lessened specific dynamic action of carbohydrate. The reaction in the three groups did not show so great a degree of difference as occurred after the protein meal. There was very little, if any, evidence of specific dynamic action of fat.

Arkansas Medical Society Journal, Little Rock

21: 71-93 (Sept.) 1924

*Mercurochrome 220 in Treatment of Typhoid. S. P. Pond and L. F. Barrier, Little Rock.—p. 71.
Undescended Testicle: Five Cases. F. B. Young, Gering, Neb.—p. 73.
Peritonitis. H. H. Altman, Helena.—p. 78.

Mercurochrome in Treatment of Typhoid.—Bond and Barrier have used mercurochrome-220 soluble intravenously in treating twelve cases of typhoid, and by its use have lessened the stay in the hospital from one-third to one-half the average time usually taken for such cases. Mild reactions with gradual decline of temperature to the norm predominated. The most severe reaction encountered was rapid rise of temperature to 108 F. with chills. This temperature remained for twenty minutes. But in the majority of our cases, when the norm is once reached, the afternoon fluctuations have not averaged over three fifths of a degree. The average maximum dose needed to procure a rapid termination of temperature was 20 c.c. to each 100 pounds of patient's weight. The authors found 15 c.c. to be the average effective dose. This may or may not have to be repeated. In cases in which hemorrhages are concurrent with indications for mercury, they use coagulin intravenously also 5 c.c. of the patient's own blood from the vein of the elbow injected directly into the deltoid muscle, and then proceed with the small dose of mercurochrome. If ptyalism occurs, a mouth-wash of turpentine is used alternately with hydrogen peroxid.

Journal of Biological Chemistry, Baltimore

61: 303-584 (Sept.) 1924

*Spinacin, New Protein from Spinach Leaves. A. C. Chibnall, New Haven, Conn.—p. 303.
Dakin's Method as Applied to Edestin. T. B. Osborne, C. S. Leavenworth and L. S. Nolan, New Haven, Conn.—p. 309.
Basic Amino-Acids Yielded by Casein. C. S. Leavenworth, New Haven, Conn.—p. 315.
Gas and Electrolyte Equilibria in Blood. VII. Effect of Carbon Monoxid on Acidity of Hemoglobin. A. B. Hastings, J. Sendroy, C. D. Murray, and M. Heidelberger, New York.—p. 317.
*Chlorids of Serum, Blood and Corpuscles in Pathologic Conditions. H. C. Gram, Philadelphia.—p. 337.
Estimation of Carbon Dioxid in Serum in Presence of Ether by Van Slyke Method. J. H. Austin, Philadelphia.—p. 345.
*Low Nitrogen Metabolism with Low Carbohydrate Diet in Diabetes. K. Petren, Lund, Seden.—p. 355.
Milk-Coagulating Enzyme of Solanum Elaeagnifolium. A. Bodansky, Ithaca, N. Y.—p. 365.
Variations in Rate of Excretion of Acetone Bodies During Day. R. S. Hubbard and F. R. Wright, Clifton Springs, N. Y.—p. 377.
Strophanthin. V. Isomerization and Oxidation of Isotrophanthidin. W. A. Jacobs and A. M. Collins, N. Y.—p. 387.
Fat-Soluble Vitamins. XVII. Induction of Growth-Promoting and Calcifying Properties in Ration by Exposure to Ultra Violet Light. H. Steenbock and A. Black, Madison, Wis.—p. 405.
Mechanism of Phlorhizin Diabetes. II. T. P. Nash and S. R. Benedict, New York City.—p. 423.
Concentration of Vitamin. B. P. A. Levene and B. J. C. van der Hoeven, New York.—p. 429.
Relation of Chemical Structure to Rate of Hydrolysis of Peptides. I. Synthesis, Physical Constants, and Rates of Hydrolysis of Methylated Peptides. P. A. Levene, H. S. Simms and M. H. Pfaltz, New York.—p. 445.
*Ether Anesthesia. III. Rôle of Lactic Acid in Acidosis of Ether Anesthesia. E. Ronzoni, I. Koechig and E. P. Eaton, St. Louis.—p. 465.
Differential Extraction and Precipitation of Soluble Proteins of Muscle; Concentration of Proteins in Muscle of Calf, Cow and Rabbit. P. E. Howe, Princeton, N. J.—p. 493.

Spinacin.—A new protein, "spinacin," prepared by Chibnall from the cytoplasm of spinach leaves (*Spinacia oleracea*), is insoluble in water and salt solutions, but is soluble in a very small excess of either acid or alkali. It contains 16.25 per cent. of nitrogen and is free from carbohydrate.

Blood Chlorids.—The chlorid concentration of serum, blood and corpuscles in various conditions has been studied by Gram, and no evidence was obtained that the chlorid concentration in the corpuscles rises and falls with the cell volume percentage.

Diet in Diabetes.—Petren treats grave cases of diabetes by a diet, very low in protein, poor also in carbohydrates (especially no bread or other farinaceous foods) but high in fat. The results indicate that the sparing influence of fat on the quantity of metabolized nitrogen is greater than has been assumed.

Rôle of Lactic Acid in Ether Acidosis.—Studies made by Ronzoni, Koechig and Eaton indicate that accumulation of lactic acid accounts in a large part for the acidosis of ether anesthesia. Its increase is independent of carbon dioxid tension and produces the changes in p_H rather than being itself controlled by p_H as stated by Anrep and Cannan. Decreased oxygen supply to tissues does not account for its production. The source of lactic acid seems to be the muscle tissues. Production of lactic acid in the muscle, together with loss of phosphate from the muscle (Stehle and Bourne), during anesthesia, points to a breakdown of some hexose phosphate, such as Embden's "lactacidogen."

Public Health Journal, Toronto

15: 391-440 (Sept.) 1924

Waiting Shadow. O. Johannsdottir.—p. 409.
Bacteria in Milk. F. Hudson.—p. 418.

Surgery, Gynecology and Obstetrics, Chicago

39: 401-542 (Oct.) 1924

*Transposition of Ovary with Vascular Pedicle into Uterus After Salpingectomy. T. Tuffier, Paris.—p. 401.
*Surgery of Knee Joint. N. Allison, Boston.—p. 409.
*Blood Coagulation. E. C. Mason, Detroit.—p. 421.
*Mortality from Empyema in Children. W. E. Ladd and G. D. Cutler, Boston.—p. 429.
*Primary Bladder Tumors in First Decade of Life. C. L. Deming, New Haven, Conn.—p. 432.
*Extraperitoneal Inguinal Hernia of Bladder: Rôle of Prevesical Fat. L. Carp, New York.—p. 443.
Cellular Immunity in Development (Pathogenesis) and Cure of Disease. A. Theilhaber, Munic.—p. 458.

*Aneurysm of Splenic Artery. E. A. Baumgartner and W. S. Thomas, New York.—p. 462.
*Leukoplakia of Kidney Pelvis. F. Hinman, A. Kutzmann and T. E. Gibson, San Francisco.—p. 472.
*Blood Nitrogen in Cancer of Prostate and Bladder. B. S. Barringer and R. Theis, New York.—p. 490.
*Large Thymus as Cause of Cyanosis in New-Born Infants. E. T. Evans, Boston.—p. 494.
Resection of Upper Maxillary with Lower Facial Flap. E. E. Lauwers, Courtrai, Belgium.—p. 499.
*Turpentine in Treatment of Epididymitis. A. A. Wren, New York.—p. 503.
*Mobilization of Stiff Metacarpophalangeal Joints. C. H. Heyman, Cleveland.—p. 506.
Wearing of Branching Stethoscope by Surgeons and Anesthetist During Operation. E. O. Kane, Kane, Pa.—p. 508.
*Diagnosis of Tumor of Head of Pancreas. J. Buckstein, New York.—p. 509.

Transplanting Ovary into Uterus.—Tuffier has performed this operation twenty-three times. The living ovary is included in the thickness of the uterine muscle, it projects partly into the uterine cavity, and is studded with corpora lutea. The ovarian tissue contains a voluminous cyst of ovular origin and a considerable number of mycrocysts with graafian follicles. The uterine mucosa, normal throughout, makes a little polypoid projection at the level of the ovarian "relief." On microscopic section the chorion is notably hypertrophic and the glandular convolutions of the mucosa are greatly hypertrophied. One is in the presence then of a moderate adenomatous evolution, circumscribed, and of a still benign appearance. Tuffier says it is justifiable to transpose an ovary with its pedicle into the uterine cavity in order to preserve menstruation and the possibility of impregnation in women who have undergone double salpingectomy. Sterility due to lesions which are seemingly benign or unrecognized is so frequent that it opens up a possibility for the application of this operative measure. In twenty-three operations he has had no deaths. He has seen two postoperative hemorrhagic extravasations coming from the section of the broad ligament on the side opposite the transposition. He has done one laparatomy and after checking the hemorrhage has had both patients get well. The after-results have been excellent in twenty-one cases.

Surgery of Knee Joint.—Experience has convinced Allison that in many clinical conditions, a high percentage of disabled knees may be returned to normal knee-joint function by appropriate surgical interference. In certain disease processes, notably tuberculosis, operation upon the knee offers the one sure method of cure. Here the operation should have for its object the establishment of ankylosis. Until such time as the treatment of tuberculosis by heliotherapy has been perfected and made practical, this would seem to be the better position to hold. In certain disease processes, notably the acute infections of the knee, operations to clean the joint cavity, or to establish drainage, hold the only promise of conservation of knee-joint function. Functional use of the lower extremity may be well carried out with a stiff, strong, weight-bearing knee. Functional use of the lower extremity is inhibited or lost if the knee be insecure, painful, or partially functioning. The dangers that come with an insecure knee are not insignificant. The menace that shadows the life of an individual with a tuberculous knee is very real. It is possible by surgical measures to restore the lost function to a knee joint. It is also possible by surgery to aid nature in healing the diseased knee.

Blood Coagulation.—Mason reports on work undertaken with the view (1) of studying more in detail the mode of action of tissue extracts in producing intravascular coagulation and (2) of determining a means of protection against such intravascular coagulation. He says that three components, fibrinogen, calcium and tissue extract, enter into the formation of the intravascular, as well as the extravascular clot. Of all agents promoting intravascular coagulation none is so potent as tissue extract. Purified heparphosphatid has been titrated against the most active tissue extract and found to neutralize the coagulant action of such extract. If clinical thrombosis and embolism are comparable with experimental thrombosis and embolism, the anticoagulant offering so effective protection in one should be of use in the other. The anticoagulant should find a clinical use as an anticoagulant in blood transfusions and also as an anticoagulant in the determination of the blood hematocrit, or wherever the hypertonic action of excess salt is contraindicated.

Empyema in Children.—Empyema in children has a moderately high mortality. The mortality is highest during the first year of life. After the eighth year the mortality should be low and in the series reported on by Ladd and Cutler it vanished. The next most potent factor in mortality is the type of the infective organism. *Streptococcus hemolyticus* yields the highest mortality of the common kinds of infection. Synpneumonic operations should be avoided as should too belated operations. Avoidance of operation before the pneumonia has resolved is a factor in the low mortality of this series. Intercostal drainage with an attempt to keep the thorax closed around the tube is the operation of choice for patients with streptococcus infection and for a few selected cases with other types of infection. Rib resection with freeing of pleural adhesions to allow for expansion of the lung is the operation of choice for the vast majority of metapneumonic cases, because it gives a lower mortality rate, requires fewer secondary operations, and yields better permanent pulmonary function. Gas-oxygen is the anesthetic of choice for rib resection. Procain with epinephrin is a valuable anesthetic for use in intercostal drainage cases. Ether is contraindicated. There were forty-eight patients under 2 years but the patients over 8 years showed no mortality. There were 160 patients with a pneumococcus infection showing a mortality of 15.62 per cent. Thirty-five patients had pure streptococcus infection, giving a mortality of 28.57 per cent. The cultures of twenty-seven patients were classified under the term miscellaneous. These showed growths of one or more kinds of bacteria; *Staphylococcus pyogenes-aureus*, streptococcus and pneumococcus appearing in combination with each other or with some other form of bacteria. In this group the mortality was 14.81 per cent. In thirty-six patients in whom the nature of the organism was unknown eight deaths occurred, a mortality of 21.22 per cent. Forty-two of the 268 patients were operated on by the closed method, that is, the tube was introduced through a cannula inserted intercostally. Of these twelve died, a mortality of 28 per cent. Of the forty-two cases having intercostal drainage, twenty-one, or 50 per cent., required secondary operations to drain the empyema adequately or to free the lung so that it might expand and close the cavity. Fewer deaths result from this secondary operation than from simple closed drainage, only two deaths occurring in twenty-one cases, a mortality of 9.5 per cent. Two hundred and twenty-six patients had rib resection. In this group the mortality was 15.9 per cent. Ten patients, 4 per cent. of the cases, required a secondary operation for the obliteration of the cavity. Ether anesthesia was used in 153 cases. Of these, twenty-seven died, a mortality of 17.64 per cent. Forty-five operations were performed under procain-epinephrin anesthesia with ten deaths, a mortality of 22.22 per cent. Fifty-eight patients were given nitrous oxid and oxygen anesthesia with nine fatalities, a mortality of 15.51 per cent. The twelve remaining patients were given a combination of anesthetics and are not included.

Bladder Tumors.—Deming reports two cases, one a myxoma and the other a rhabdomyoma, and analyzes sixty-four cases from the literature.

Extraperitoneal Inguinal Hernia of Bladder.—Carp asserts that extraperitoneal inguinal hernia of the bladder is infrequent, and occurs mostly between the third and fifth decades, in the male, and on the right side. A total of sixty-one cases were studied. Bladder symptoms and incarceration are absent in the majority of cases. Prevesical fat is invariably present, and it may be inferred from experimental and clinical evidence that this fat, by traction, plays the major rôle in the production of extraperitoneal inguinal bladder diverticula. In view of this fact all lipoceles are potentially operative, and should be resected when encountered on the operating table.

Aneurysm of Splenic Artery.—From a study of forty cases of splenic artery aneurysm collected from the literature from 1847 to 1923 Baumgartner and Thomas have found that six patients were operated on and four of these recovered. The first one operated on was reported by Winkler in 1905 with recovery. Thirty-three of the cases were diagnosed at necropsy. In most of these, death was directly due to the

aneurysm. Many had had symptoms of abdominal pain or distress, enlarged spleen, and gastro-intestinal hemorrhage; a few had epigastric tumor with murmur. In most of them the diagnosis was indefinite, which is shown also by the variety of diagnoses made. With the symptoms of abdominal pain, gastro-intestinal hemorrhages, splenic and epigastric tumors, and roentgen-ray studies ruling out tumor of the stomach, the authors say aneurysm of the splenic artery should be considered and operation advised, for in operation lies the only hope of recovery in these cases.

Leukoplakia of Kidney Pelvis.—Two new cases of leukoplakia of the renal pelvis are reported by Hinman, Kurtzmann and Gibson. Leukoplakia of the urinary tract, and particularly of the renal pelvis is relatively rare, only thirty-three cases having been reported in the renal pelvis. The etiology of leukoplakia is unknown. The symptomatology is that of urinary tract infection (cystitis, pyelitis, pyelonephritis, pyonephrosis) and urinary lithiasis, conditions with which it is usually associated. The treatment of choice is nephrectomy, since the disease is incurable and precancerous. The important points brought out in the cases reported are briefly outlined.

Blood Nitrogen in Prostate and Bladder Carcinoma.—Blood urea nitrogen was determined by Barringer and Theis in twenty-five cases of prostatic carcinoma, and forty-nine cases of bladder carcinoma. In 20 per cent. of cases of carcinoma of the prostate, and in 10 per cent. of cases of carcinoma of the bladder there was a definitely high blood urea. In forty-one cases of carcinoma of the bladder which were treated by means of cystotomy and radium implantation, there were no immediate deaths from operative shock; there was but one death due to renal failure, twelve days after operation; one death from diabetic coma, two and one-half months after operation, and one from lung metastases (not recognized prior to operation) five weeks after operation. A high urea nitrogen definitely indicates that the kidneys may not stand the strain of operation.

Thymus as Cause of Cyanosis.—In new-born infants who develop cyanosis, whether constant or intermittent in attacks, in the absence of other definite cause, Evans says, persistent large thymus should always be suspected. Such infants, even in extremis should be given the benefit of roentgen ray or radium therapy. Plates should be taken before and after treatment, to follow results. However, negative plates do not mean "no thymus pressure," as it is anteroposterior thickness and weight of thymus, not width, which causes pressure, unless the symptoms are due to an endocrine disturbance.

Turpentine in Treatment of Epididymitis.—To ascertain the therapeutic value of turpentine injections, 100 cases of epididymitis had been subjected by Wren and Tenenbaum to that treatment exclusively. An emulsion of 20 per cent. turpentine in olive oil was administered upon the pelvic bone fascia at intervals of two days, each injection containing from 0.5 to 1 c.c. of the emulsion. The injections were followed, in the majority of the cases, by analgesia and involution of the tumor-like swelling. In many instances a single injection sufficed to relieve the pain in from six to twelve hours after the injection. On the average, from three to four injections were administered in an individual case. The authors' experience, which is based on over two years of careful clinical observation, leads them to conclude that turpentine by injection deserves a prominent place in the treatment of epididymitis.

Mobilization of Stiff Metacarpal Joints.—Certain cases of stiff metacarpophalangeal joints resist all forms of conservative treatment by physical measures. Satisfactory operative results have been obtained by Heyman by a transverse section of the posterior half of the capsule of the joint, followed by temporary fixation in extreme flexion. The modification of the banjo splint is useful after this flexion has been obtained, and is preferable because of its comparative inconspicuousness, simplicity, and usefulness in obtaining passive motion in conjunction with traction.

Diagnosis of Pancreas Tumor.—In a case cited Buckstein passed a rubber tube until the metal tip reached the end of the transverse duodenum, as determined fluoroscopically. The last 10 inches of tube is perforated with numerous small openings. Barium was injected through the proximal end of the tube, and a roentgenogram taken. Not only was the tube well visualized, but the barium escaping through the holes in the distal portion of tubing, outlined the duodenum. In this manner, a much clearer idea of the duodenal curve was obtained than was possible by the ordinary indirect method of barium ingestion. The duodenal curve appeared to be enlarged, suggesting a tumor of the head of the pancreas as a cause. This was confirmed by an exploratory laparotomy.

Tennessee State Medical Association Journal, Nashville

17: 149-179 (Sept.) 1924

Sterility in Female. F. D. Smythe, Memphis.—p. 149.
*Value of Inflation of Fallopian Tubes and Pneumoperitoneum with Carbon Dioxid. L. E. Burch, Nashville.—p. 154.
*Ligation of External Iliac Artery for Arteriovenous Aneurysm. W. O. Floyd, Nashville.—p. 159.
Appendicitis. W. A. Bryan, Nashville.—p. 162.
Milk Injection in Inflammatory Eye Diseases. R. H. Newman, Knoxville.—p. 165.
Sensitization. H. C. Long, Knoxville.—p. 170.

Value of Inflation of Fallopian Tubes and Pneumoperitoneum.—Burch regards inflation of the peritoneum by either the abdominal or uterine route as being perfectly safe, provided the contraindications are remembered and carried out. It is the greatest aid in obscure pelvic cases and will make an accurate diagnosis possible. A certain number of women who are sterile and whose tubes have been found patent will conceive following inflation.

Traumatic Arteriovenous Aneurysm.—Floyd's patient developed a traumatic arteriovenous aneurysm under Poupart's ligament following a gunshot wound. Floyd ligated the external iliac artery and vein just below their origin on the right side, and the common femoral artery and vein just below the aneurysmal mass. The mass was left undisturbed. The patient made a complete recovery.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Indian Medical Gazette, Calcutta

44: 429-480 (Sept.) 1924

*Dracontiasis. N. H. Fairley.—p. 429.
Diagnosis of Kala-Azar by Examination of Thick Blood Films. R. Knowles and B. M. Das Gupta.—p. 438.
*Endameba Histolytica Carriers. H. W. Acton and R. Knowles.—p. 440.
Device for Ionization of Urethra. J. H. Barrett.—p. 444.
Local Concentration of Drugs. J. W. Barnett.—p. 447.
Spotted Fever at Nagpur. A. F. W. da Costa.—p. 450.
Pyorrhea Alveolaris. J. J. Mody.—p. 452.

Dracontiasis.—A special method of mechanical extraction of the worm is advocated by Fairley and consists of intermittent traction of the worm accompanied by massage in the direction of the sinus, the muscles in the vicinity being relaxed. A new operative technic based on the structural relationships of the worm is described. The parasite is located and the operation is conducted under local anesthesia. The results in a series of nineteen cases are tabulated, and of these thirteen were cured within one week, three within a fortnight, and two within twenty-one days. The remaining case, which was complicated by a local abscess, took one month to recover. The subcutaneous injection of 10 minims of 1:1,000 solution of epinephrin hydrochlorid has been found to relieve immediately the distressing prodromal symptoms such as urticaria, erythema and asthmatic manifestations which so often herald the appearance of *D. medinensis* in the subcutaneous tissues. Its use in this stage of the disease is advocated.

Endameba Histolytica Carriers.—Action and Knowles state that the common carrier of *E. histolytica* infection is not always or even usually free from all clinical symptoms, and that sometimes a careful search of the stool for cysts of this parasite in such conditions as arthritis, neuritis, asthma, urticaria, leukoderma and erythema nodosum may be followed by discovery of the cysts, the appropriate bismuth and emetin treatment, and recovery from the symptoms of which the patient originally complained.

Indian Medical Record, Calcutta

64: 225-256 (Aug.) 1924

Adventitious Sounds in Diagnosis of Diseases of Chest. U. Basu.—p. 225.
Public Health. K. C. Dube.—p. 227.
Lathyrism. H. G. N. Mukerji.—p. 230.
Epidemic Dropsy. K. Dutt.—p. 237.
Vitamins in Health and Disease. A. K. M. Abdul Wahed.—p. 242.

Irish Journal of Medical Science, Dublin

395-431 (Sept.) 1924

*Postmortem Report on Lethargica Encephalitis. E. C. Smith.—p. 395.
Surgical Significance of Ascending Mesocolon. A. A. McConnell.—p. 402.

Pathology of Lethargic Encephalitis.—The changes found by Smith in the heart, kidney, liver and spleen in his case, he says, seem to point to a diffusely acting toxin as the offending agent. There may also be some relation between the pulmonary condition and the encephalitis, possibly the virus of the disease finds an easy entrance through the inflamed bronchial mucous membrane. Hemorrhages were noted in relation to the conduction fibers of the heart. Congestion and hemorrhages were the principal lesions found.

Journal of Laryngology and Otology, Edinburgh

39: 429-480 (Aug.) 1924

*Nature and Path of Infection in Tonsils. W. G. Howarth and S. R. Gloyne.—p. 429.
*Injury to Larynx by Roentgen-Ray Treatment. O. Stranberg.—p. 437.
Laryngeal Nodes. A. Wylie.—p. 441.
Ménière's Original Case. D. M'Kenzie.—p. 446.
Case of Glass Bead in Lungs. H. Hanna.—p. 450.
Removal of Tooth Plate from Esophagus. T. A. MacGibbon.—p. 451.

Tonsillar Infections.—Howarth and Gloyne are convinced that about one half the children with enlarged and unhealthy tonsils associated with cervical adenitis harbor, in some portion of their tonsils, bacteria which are pathogenic to mice, the streptococcus being the commonest organism found. The line of march of these infecting bacteria appears to be through the stratified epithelum (generally of the crypts), into the diffuse lymphoid tissue immediately beneath, and thence along the trabeculae to the capsule where they pass into the larger lymph vessels of the pharyngeal wall which drain into the deep cervical glands. Tuberculous infection of the tonsil is not very common. The authors assert that it only occurs in about 5 per cent. of cases. They suggest that in the majority of cases the enlargement of the tonsils is due to the presence of saprophytic and pathogenic bacteria, and that septic absorption from these infected tonsils produces cervical adenitis, the most marked cases being those due to pyogenic streptococci. At a later stage, a tonsil already heavily charged with these pathogenic and saprophytic organisms may become infected with the tubercle bacillus. Probably the whole process is slow and insidious, and the infecting tubercle bacilli are few in number.

Injury to Larynx by Roentgen Ray.—While under roentgen-ray treatment for a lymphoma in the front of the neck, Strandberg's patient became hoarse. Eight months later he complained of pain in the throat and dyspnea. In the front of the neck the skin was considerably atrophied, with great dilatation of the vessels. In the middle of the atrophied part there was an ulcer the size of a halfpenny; in its center was a fistula, and in that a sequestrum of the thyroid cartilage. The epiglottis and the ventricular bands were swollen, and in the interarytenoid region was a small ulcer. The histologic examination of several pieces of the mucous membrane of the larynx showed no tuberculosis or cancer, but merely changes due to the roentgen rays. The patient recovered, but his voice remained hoarse and the mucous membrane of the larynx remained swollen.

National Medical Journal of China, Shanghai

10: 205-282 (Aug.) 1924

Epidemic Encephalitis. H. Nai-Lee Zee.—p. 205.
Tuberculous Infection. C. Y. Wang.—p. 237.
Tuberculosis of Cervical Lymph Glands. J. S. Chu.—p. 245.
*Mastoiditis: Radical Mastoidectomy by Nature. L. C. O. Han.—p. 248.
*Fifteen Hundred Chinese Blood Groups. L. Chi-Pan.—p. 252.

Mastoiditis in China.—Han analyzes 880 ear cases. Among these were 594 cases of otitis media and only ten cases of mastoiditis, three of which were complicated with postauricular abscess. One of the latter patients developed a perforation into the mastoid. This perforation discharged purulent material for more than a year. Finally, under appropriate treatment it healed.

Chinese Blood Groups.—Chi-Pan found that among the Chinese Group I composes 31.3 per cent.; Group II, 38.1 per cent.; Group III, 20.7 per cent.; and Group IV, 9.9 per cent. of all bloods examined.

Practitioner, London

63: 137-204 (Sept.) 1924

Operations in Surgical Emergencies. D'Arcy Power.—p. 137.
Unfolding of Patient's Life. C. Dukes.—p. 142.
Advantages and Disadvantages of Small Medical School. A. Abrahams.—p. 152.
Compensatory Hypertrophy of Middle Turbinal. M. Yearsley.—p. 165.
Arthritis. B. Whitchurch.—p. 169.
Errors in Diagnosis Arising in Fibrositis of Abdominal and Thoracic Walls. J. Liddell.—p. 182.
Fractional Volumetric Examination of Urine. P. Bergouignan.—p. 184.
*Effect of Sodium Chlorid Intake on Blood Pressure. E. G. B. Calvert, and S. W. Lane.—p. 193.
*Other Side of Sun. L. Wainwright.—p. 197.

Effect of Sodium Chlorid on Blood Pressure.—Calvert's investigation consisted in noting the changes in blood pressure and chlorid (as sodium chlorid) exertion, in four normal persons, seven cases of hyperpiesis with no obvious renal damage, three cases of chronic interstitial nephritis, and in two cases of secondary contracted kidney, when the twenty-four hour dietary contained: (*a*) the normal amount of sodium chlorid, about 12 gm.; (*b*) from 20 to 25 gm. and from 2 to 4 gm. sodium chlorid. The investigation shows that the amount of sodium chlorid consumed can exercise an appreciable, sometimes a marked, influence on blood pressure. Even in the normal person a decided increase or decrease of salt ingestion tends, respectively, to a rise or fall of pressure. The value of a low sodium chlorid dietary in lowering blood pressure in cases of hyperpiesis without apparent renal damage was shown. Some advantage is gained in cases of chronic interstitial nephritis by reducing the salt consumption. A large amount of salt is injurious. In cases of secondary contracted kidneys a dietary containing the minimum of sodium chlorid is likely to prove most useful. In the various types of cases examined, the ability to excrete chlorid is least in cases of secondary contracted kidney, somewhat better in cases of chronic interstitial nephritis, and only a little subnormal in hyperpiesia. The normal response is prompt and marked; the degrees of alteration in blood pressure are largely in the inverse order. The beneficial effect of sodium chlorid restriction in controlling blood pressure in patients without edema would seem, therefore, to vary more or less directly with the degree of impairment of excretion. To obtain satisfactory results the quantity of salt taken should be reduced to 2 or 4 gm. per day for a couple of weeks, after which it may be increased slightly.

Dangers of Sunlight.—Wainwright speaks of the dangers of sunlight and thinks it possible that the nerves of healthy children indiscriminately exposed to its powerful and stimulating rays may suffer very severely in a way that their guardians never realize. Children should have well shaded perambulatbr covers, and should be kept in a light, but shaded position. On the beach they should have proper hats to shade their necks and spines, and they should not paddle where they will get the reflected glare of the sea in their eyes.

South African Medical Record, Cape Town

22: 271-294 (June 28) 1924

*Blackwater Fever. O. E. Jackson.—p. 273.
Opacities in Vitreous (Asteroid Hyalitis). F. H. Robinson.—p. 286.
*Mitral and Aortic Disease Recovered from Auricular Flutter. H. L. Heimann.—p. 287.
*Malaria Treatment of Progressive Paresis. J. M. Moll.—p. 288.

Blackwater Fever.—Jackson asserts that hemoglobinuria is a symptom of pernicious malaria, and should be classified as such. Blackwater fever is not coextensive with malaria, but it is coextensive with malignant malaria wherever it is especially intense. And it is in the countries where the parasite found is the quartan or tertian causing severe malaria that it is not coextensive. The disease is contracted in nonmalarial places. It has occurred months and even years after the

patient has left the tropics. The patient has left the tropics with malaria latent in his system, development of the parasite has proceeded until, gradually, after a varying period, a high degree of latency is brought about, while the necessary acidemic condition has gradually grown with the increasing depths of latency, until suddenly one of the exciting factors produces the explosion. In Jackson's opinion a recognition of repeated attacks of malaria with resulting acidosis, and this acidemic condition further increased by occasional dosing with quinin which fails to cure, implanted in a patient who lives a life of habitual acidemia, will explain all that is necessary toward the production of the hemoglobinuria, occurring in what otherwise might be an ordinary attack of malaria. It explains also the failure in treatment.

Mitral and Aortic Disease Recovered from Auricular Flutter.—Heimann's case shows how evidence of valvular mischief disappears during failure of compensation. He also refers to a case in which the liver was acutely distended to the umbilicus and tender, of six hour's duration, due to acute heart failure in a case of paroxysmal tachycardia caused by seasickness while crossing the English Channel.

Malaria Treatment of Paresis.—Moll reports two cases of paresis in which inoculation with malaria blood was followed by very satisfactory results. This is merely a preliminary report.

Annales des Maladies Vénériennes, Paris

19: 641-720 (Sept.) 1924

Studies with Bismuth and Mercurials in Experimental Syphilis. J. H. Hill and H. H. Young (Baltimore).—p. 641.
*Combined Tuberculosis and Syphilis. Mouradian.—p. 649.

Nefarious Action of Arsphenamin on Tuberculosis in the Syphilitic.—Basing his statements on eighteen observations, Mouradian affirms that arsphenamin treatment is liable to aggravate fatally tuberculous lesions in syphilitic patients. The arsphenamin poisoning, which causes a defective nutrition and anemia, interferes also with the functioning of the lungs. It inhibits the defense of the lungs. Mercuric cyanid may sometimes act favorably on the tuberculous process, while arsphenamin, on the other hand, he thinks, is liable to rouse a latent tuberculous lesion, and speed up a chronic into an acutely fulminating form.

Annales de Médecine, Paris

16: 167-246 (Sept.) 1924

Suptaglottic Method for Intratracheal Injections. G. Caussade and A. Tardieu.—p. 167.
*Two Epidemics of Febrile Jaundice. S. Costa and J. Troisier.—p. 180.
*Caffein and Insulin Antagonism. Labbé and Théodoresco.—p. 211.
Hydrocephalus, Occipital Encephalocele and Spina Bifida. L. Delrez and J. Firket.—p. 218.
*The Lymphocytes and Cancer. M. Loeper and R. Turpin.—p. 237.

Relations Between Epidemic Jaundice, Sporadic Catarrhal Jaundice and Acute Yellow Atrophy of the Liver.—Costa and Troisier's observations of two epidemics of febrile jaundice, with eighty-three and twenty-three cases in the hospitals, showed the clinical features and the morbid anatomy to be the same in sporadic catarrhal jaundice and in epidemic jaundice. The period of incubation was seven to nine, or even thirteen days; but usually did not surpass one week. The disease seemed to have been transmitted from man to man by way of the digestive tract, and by healthy carriers. The cook of the battalion was the propagator of the infection, by contaminating the food, as in typhoid fever. The epidemics happened in summer, and disappeared with the first cold days.

Physiologic Antagonistic Action of Caffein and Insulin on Glycemia.—Labbé and Théodoresco found a lowering of the glycemia after a simultaneous injection of insulin and caffein in animals. They ascribe the enhancing action of caffein on the glycemia to hyperepinephrinemia. The inhibitory action of insulin on caffein hyperglycemia may perhaps be explained by the antagonism of the pancreas and the suprarenal capsules in regulation of glycemia.

Lymphocytosis in Cancer.—Loeper and Turpin's researches on induced lymphocytosis in white rats with experimental sarcoma confirmed that the lymphocyte reaction around the cancer does not take any part in defense of the organism against the morbid process.

Archives des Maladies de l'Appareil Digestif, etc., Paris

14: 581-676 (July) 1924

*Function in Operated Cystic Pancreas. M. Labbé.—p. 581.
*Tuberculosis and Gastric Ulcer. A. Cade and P. Ravault.—p. 586.
Gastric Cancer with Free Hydrochloric Acid. V. Pauchet and A. Hirchberg.—p. 603.
*Syphilis in Plastic Linitis. G. Faroy.—p. 616.

Functioning of Stump of a Cystic Pancreas.—Labbé refers to a personal case of a cystic pancreas in a woman, aged 45. Although 2 cm. of the altered pancreas were all that was left after the three operations, no changes in protein metabolism, nor in the functioning of the liver were apparent. Consequently, with any disturbance in the functioning of the pancreas, even very slight, we are justified in assuming grave changes in the organ.

Tuberculosis in Pathogenesis of Gastric Ulcer.—Cade and Ravault emphasize the frequent coexistence of tuberculosis, mostly of the lungs, with ulcer of the stomach. Tuberculosis was manifest in thirty-nine out of their 139 cases of gastric ulcer, preceding or accompanying the ulcer in thirty-four instances. In five patients only, the tuberculous lesions appeared after the ulcer. They believe that the two are independent of each other, as different localizations of the same infection. The bacillemia, or rather toxemia, produces an endarteritis, obstruction of the vessels, and consequently ulcer. The microscopic findings may not show the tuberculous nature of the ulcer, while atypical forms of the lesion are frequent.

Syphilis as Factor in Plastic Linitis.—Faroy describes three cases of leather-bag stomach; in two, the plastic linitis coincided with syphilis. The metastases in the glands and in the liver reproduced the special character of the gastric cancer. He insists that syphilis, with its tendency to generalized formation of sclerous tissue, may be a decisive factor in linitis. Chronic alcohol poisoning may also take some part in the pathogenesis of linitis.

Archives de Médecine des Enfants, Paris

27: 577-640 (Oct.) 1924

Prevention of Tuberculosis in Children in Morocco. J. Colombani and J. Lapin.—p. 577.
Fighting Child Mortality in Morocco. Legey.—p. 583.
Cephaloplegia in Children. F. Figueira.—p. 587.
Seashore Hospitals for Children Under Four. L. Jaubert.—p. 592.
*Mediastinal Lymphocytoma in Infant. J. Renault et al.—p. 611.
Antituberculosis Serotherapy in Children. J. Comby.—p. 617.

Lymphocytoma of Thymus Origin in Infant.—Renault, Cathala and Plichet report a case of primary malignant lymphocytoma in the anterior mediastinum in an infant, aged 20 months. Death occurred from suffocation nine months after the first signs had been noted. The child, who was well developed, appeared well nourished to the last. The localization suggested that the tumor had developed from the thymus, although the histologic examination did not reveal the presence of Hassall's corpuscles in it.

Encéphale, Paris

19: 481-552 (Oct.) 1924

*Case of Isolated Ganser's Symptom. H. Claude and G. Robin.—p. 481.
*Vaquez's Disease with Softening of Brain. K. Winther.—p. 493.
*Pseudocorrection in Ptosis with Strabismus. D. Paulian.—p. 506.
*Value of Psychanalysis. R. de Saussure.—p. 509.

Case of Ganser's Symptom.—Asserting that the complete picture of Ganser's syndrome occurs only exceptionally, Claude and Robin report a case of the isolated symptom of crooked or absurd replies to questions—*réponses à coté; vorbeireden.* The symptom revealed some mental dissociation, resulting from a primary emotional disturbance. They do not agree with Ganser that the symptom is merely a manifestation of hysteria, but believe that an emotion may create disturbances of hysterical type in abnormal emotivity.

Vaquez' Disease Associated with Softening of the Brain.—Winther describes a case of polycythemia with splenomegaly and multiple foci of softening of the brain in a man, aged 49. The necrosis was caused by a thrombosis, which was probably due to local congestion.

Automatic Pseudocorrection in Ocular Ptosis and Strabismus.—Paulian noted in several patients with ptosis and

external strabismus that the disturbance could be temporarily abolished by closing the other eye. The right eye was usually involved, and the subjects were tabetics. The mechanism of this correction may be explained by the crossing of common fibers in the nuclei of the common and external oculomotor nerves. The correction should be considered as a differential ocular symptom in tabes, as it is lacking in meningeal lesions, in cases of tumors, and with osteoperiostitis of the base of the skull.

Psychanalysis in Study of the Unconscious.—Saussure defends psychanalysis, in spite of its imperfections, as the best method for study of the unconscious. The method should not be rejected, but perfected.

Journal de Chirurgie, Paris

24: 385-512 (Oct.) 1924

*Reconstruction of Fractured Humerus. P. Fredet.—p. 385.
Heating Mixed Anesthetics for General Anesthesia. P. Rolland.—p. 409.

Fracture of the Humerus.—Fredet reports the results of recent reexamination of his twenty patients treated by reconstruction of the humerus in the last twelve years. Ordinary fractures heal without special measures. Even if coaptation is not perfect, the deformity is slight and functioning is not impaired. But with grave fractures, as from railroad or automobile accidents, measures to aid in the reconstruction of the bone are indispensable. With suture of recent fractures or of fractures with pseudarthrosis, bony consolidation was always good and in the correct attitude. When the bone was reconstructed with a metal plate or encircling wire, the callus was always exuberant and there was spindle-shaped enlargement, while consolidation was slow. The suture material used was generally embedded in the callus and caused no disturbance of any kind. The ultimate function was good in all his cases. The details of the osteosynthesis in each case are shown in illustrations taken at the time and later.

Journal d'Urologie Médicale et Chirurgicale, Paris

18: 105-200 (Aug.) 1924

Plastic Operation on Cicatricial Ureter. G. Gayet.—p. 105.
*Contraindication for Diversion of Urine. A. Damski.—p. 108.
Case of Amyloid Degeneration of the Kidney. Lévy and Négro.—p. 113.
Case of Plasmocytoma in Bladder. G. Marion and Leroux.—p. 121.
*Fulguration for Urethral Folliculitis. Busson.—p. 124.

Contraindication for Diversion of the Urine with Cancer of the Bladder.—Referring to six cited cases and one personal, Damski points out that in some instances of inoperable cancer in the bladder, there is profuse secretion from the tumor. This is followed by excessive irritation and painful tenesmus, especially in cases with hematuria. The disturbance persists after bilateral nephrostomy or ureterostomy. It may even be assumed that the secretion becomes more irritant in the absence of the urine, and aggravates the contractions of the bladder. Damski considers the operation as contraindicated in cases in which the urine is mixed with secretions from the tumor.

Fulguration in Abscess of Lower Genito-Urinary Tract.—Busson obtained encouraging results in three cases of gonococcus abscess in the prepuce treated with high-frequency currents. These abscesses usually resist irrigations and injections. Also dilatation of the urethra often fails. The fulguration produces an eschar, which is followed by a free discharge of pus from the follicular gland. From two to eight applications, each of from five to fifteen minutes, were used.

Lyon Chirurgical

21: 525-648 (Oct.) 1924

*Sympathectomy in Facial Paralysis. W. S. Nowikoff.—p. 525.
*Permanent Gastrostomy. C. Cornioley.—p. 529.
Provisional Prostheses. L. Michel and J. Haour.—p. 536.
Experiences with Periarterial Sympathectomy. L. Hybner.—p. 542.

Operative Treatment of Lagophthalmos.—Nowikoff refers to Leriche's removal of the superior cervical sympathetic ganglion of the sympathetic to cure lagophthalmos from facial paralysis. His patient has had no recurrence during the two years since. Nowikoff reports three more cases, with a complete cure in one and great improvement in the others. In one case the operation was done during extirpation of the parotid gland for cancer, to ward off lagophthalmos. No untoward by-effects were observed in any instance.

Improved Gastrostomy.—Cornioley gives an illustrated description of his method for making a permanent fistula into the stomach with a skin-fat tube to form a siphon. The rubber feeding tube is introduced only at meal times, and is removed afterward. The opening is continent at all times.

Médecine, Paris

5: 901-976 (Sept.) 1924

*Recent Research in Biology. J. Gautrelet.—p. 901.
The Normal Life. C. Richet.—p. 912.
*The Lacunar System. C. Achard.—p. 917.
Experimental Research on Means for Fixation of Calcium. L. Binet and M. Vagliano.—p. 923.
*Biologic Basis for Treatment of Dermatoses. A. Lévy-Franckel and Juster.—p. 928.
Measure of Surface Area of Child Body. P. Lassablière.—p. 934.
*The Practitioner and the Threshold of Disease. C. Legrand.—p. 936.
Aviation from Medical Standpoint. J. Beyne.—p. 945.
*Biologic Variations of Monocellular Organism. E. Bachrach.—p. 948.
Diagnosis of Tuberculous Meningitis from Puncture Fluid. M. Mestrezat.—p. 952.
Diagnosis from Ascitic Fluid. J. Levesque.—p. 958.
Hypodermic Oxygen Treatment. M. Fourcade.—p. 964.

Recent Research in Biology.—Among the communications reviewed by Gautrelet is Pachon's on the increase in reflex excitability with increasing tension of the muscle and tendon involved. The knee-jerk, for instance, may be abolished or exaggerated merely by a reduced or exaggerated tonus of the quadriceps and its tendon. Fonteyne's work has confirmed that the normal creatinin content of the blood averages 1.75. The prognosis is grave if it reaches 3.40. The creatinemia is not influenced by pathologic conditions. The creatininemia is not influenced by the food as much as blood urea; tests for creatinin in nephritis may prove instructive when tests for uremia are uncertain. Richet's insistence on the loss of certain properties of meat when it is cooked is the basis of his "zomotherapy" in tuberculosis. He has been preaching since 1890 the value of raw meat in tuberculosis.

The Internal Medium of the Body.—Achard contends that the blood is not the real internal medium of the body; it has only an indirect action on the life of the cells. The directly acting medium is the fluid found in all the intercellular spaces, clefts and cavities throughout the body, and he has been studying the interplay between these two systems, the circulatory and the lacunar. Sodium chlorid is especially important, not only for regulation of physical conditions, but also for chemical regulation, and this not only in edemas, but in local variations in the pressure in lacunar fluids, as in the eye, the ear, the pleura, the pericardium. This mechanism should be borne in mind in treatment.

Treatment of Certain Dermatoses.—To treat, with topical measures alone, dermatoses which are only the manifestation in the skin of an internal nervous-endocrine derangement, is as absurd as to treat locally alone the skin lesions of the secondary phase of syphilis. Urticaria has already dropped its mask of an independent skin affection, and revealed itself as a symptom of a general upset in the colloid balance. The basal metabolism curve is the guide to treatment of skin lesions connected with endocrine derangement. On the other hand, pilocarpin and epinephrin give the clues for treatment of alopecia areata in many cases. Ingestion of thallium acetate induced alopecia areata in the rabbit. The same result has been obtained in animals by severing the posterior branch of the second cervical nerve, and A. Thomas witnessed a similar patch of alopecia in a soldier wounded in this region. Besredka's recent study of "local immunity" confirms the physiologic and specific therapeutic action of the cells of the skin.

On the Threshold of Disease.—Legrand states that the diastolic blood pressure (Vaquez-Laubry) was never higher than 100 mm. in 100 young and healthy men tested. Some organic lesion was always found to explain a figure above this, in his clinical experience. The phenolsulphonephthalein test is also instructive in incipient disease, and likewise the oculocardiac reflex and Goetsch's test. The Wassermann test is liable to be misleading in incipient syphilis.

Biologic Variations of a Monocellular Organism.—Bachrach applied different poisons to lactic acid bacilli, and estimated their action by the production of lactic acid thereafter. He found that it was thus possible to modify the cell so that it became at the same time more resistant to some drugs, and more susceptible to others.

Nourrisson, Paris

12: 289-368 (Sept.) 1924

Tuberculosis in Infants. A. B. Marfan.—p. 289.
*Action of Heat on Milk and Starchy Foods. E. Rousseau.—p. 311.
Measures to Reduce Mortality from Congenital Debility. G. Salès and Pierre Vallery-Radot.—p. 328.
Spasm Element in Acute Pyloric Stenosis in Infants. Morlet.—p. 350.

Action of Heat on Milk and on Starchy Foods.—Rousseau concludes from study of recent international literature that the duration of the heating, rather than the degree of heat, seems to be deleterious for the vitamins. The physical or chemical changes, which occur in calcium salts and in lecithins during the heating, do not affect the nutritive value of the milk. The changes in fats and in lactose are insignificant. The colloid state of cooked starch favors its conversion into sugar or lactic acid by ferments in the digestive tract.

Paris Médical

281-296 (Oct. 11) 1924

Radiographic Study of Cervical Ribs. A. Léri and N. Péron.—p. 281.
Pseudohypertrophy of the Growing Heart. G. Rosenthal.—p. 285.
*Returns of Positive Wassermann Reaction. H. Gougerot.—p. 289.

Paradoxical Returns of Positive Wassermann Reaction.—Gougerot observed a sudden recurrence of a positive reaction, which persisted from several days to several weeks, in seven syphilitics. It occurred in spite of prolonged and intensive treatment, and after repeated tests had been negative. The positive reaction appeared in one patient eight or nine months after vigorous mercurial treatment; the second time fourteen months after four arsenical courses, and, again, thirty-five months after a third bismuth course. These instances are an argument for a combined treatment, which should be prolonged during several years.

Schweizerische medizinische Wochenschrift, Basel

54: 905-928 (Oct. 2) 1924

*Birth Injury of Brain. B. Fischer.—p. 905.
*Traumatic Shock and Exhemia. J. H. and H. Oltramare.—p. 912.
*War and Medical Bibliography. W. Gammeter.—p. 914.
*Prevention of Sex Delinquency. C. Strasser.—p. 916. Conc'n.

Birth Injury of Brain.—Fischer reviews extensively the results of investigations made in his institute on birth injuries of the brain. Such injuries do not occur naturally in animals, but were produced by Schwartz by application of a suction apparatus on the head of new-born puppies. All the myelin granules in the glia cells are of pathologic origin. The injuries are most pronounced in prematurely born infants. It is amazing that any skulls are able to stand application of forceps. The 10 per cent. of deaths during the first month are chiefly due to birth injuries. He describes the points of predilection for them.

Traumatic Shock and Inspissation of the Blood.—J. H. and H. Oltramare confirm the increased number of erythrocytes during shock. This fact, together with the findings of a diminished total volume of circulating blood, speaks for a loss of fluid from the blood into the tissues (exhemia).

War and Medical Bibliography.—Gammeter has compiled statistics of the number and source of quotations in German, French and English scientific papers published before and since the war. The German authors have the most quotations (twenty-seven per paper), and 80 per cent. of these are from German sources. The average in English papers is eight, 78 per cent. of which are English. French authors quote 30 per cent. of foreigners, in spite of the alleged lack of knowledge of other languages than French.

Prevention of Sex Delinquency.—Strasser's statistics demonstrate the failure of simple criminal punishment of exhibitionists, homosexuals and similar instances of sexual delinquency (72 per cent. recurrences). A conditional sentence, combined with medical supervision, gave much better results. He protests against the legal authorities who see sabotage of the laws in cases in which the physician's opinion differs from their view.

54: 929-952 (Oct. 9) 1924

Social Insurance for Old Age. H. Giorgio.—p. 929.
*Swiss Tuberculosis Law. O. Weber.—p. 936.
*Mortality Statistics and Heredity of Cancer. J. Aebly.—p. 942.

Swiss Tuberculosis Law.—Weber reports on the proposed Swiss tuberculosis law. One of its most important features is a provision for indemnities for germ carriers who have to be forbidden their usual work.

Mortality Statistics and Heredity of Cancer.—Aebly finds after elimination of certain factors a surprising stability in the cancer mortality in Switzerland in the years 1896-1920. He considers this an indication of the heredity of the predisposition to cancer, and of its independence of external factors.

Pediatria, Naples

32: 1129-1192 (Oct. 1) 1924

*Treatment of Spasmophilia. G. Genoese.—p. 1129.
Micrococcus Paramelitensis. M. Gerbasi.—p. 1139.
*Hematopoiesis in the New-Born. R. Pollitzer.—p. 1144.
*Bismuth Excretion by Milk. G. C. Bentivoglio.—p. 1155.
*Foot Phenomenon in Meningitis. C. Nizzoli.—p. 1168.
"Desquamative Erythrodermia." A. Gismondi.—p. 1172.
Situs Inversus with Congenital Heart Disease. A. De Capite.—p. 1175.

Treatment of Spasmophilia.—Genoese prescribes for spasmophilia in children 1-2 gm. of calcium bromid, daily, with 15-30 drops of a 0.1 per cent. epinephrin solution in 100-150 gm. of fluid.

Hematopoiesis in the New-Born.—Pollitzer found high figures for hemoglobin and for the red and white cells in the newly born. The average percentage of the neutrophils was 66 per cent. on the first and 57 per cent. on the sixth day; the percentage of lymphocytes increased from 25 per cent. to 40 per cent.

Bismuth Excretion by Milk.—Bentivoglio found that bismuth passes into the breast milk irregularly and in small quantity.

Foot Phenomenon in Meningitis.—C. Nizzoli found the phenomenon described in 1919 by A. Nizzoli early, constantly, and exclusively in meningitis. The patient lies on his back with extended lower extremities. Flexion of one leg in the knee and hip joint causes a dorsal flexion of the great toe on the other, extended leg.

Policlinico, Rome

31: 1291-1322 (Oct. 6) 1924

Fracture of Carpal Scaphoid Bone. Dalla Vedova and Tancredi.—p. 1291.
*Treatment of Itching. G. B. Podestà.—p. 1296.
Adenoids and Retrobulbar Neuritis. Leale.—p. 1300.

Treatment of Itching.—Podestà had some results with autohemotherapy and intravenous injections of sodium silicate. In a few patients, from six to twelve injections of 5 or 10 c.c. of a 0.5 per cent. solution of acriflavin seemed to be the best method.

31: 509-568 (Oct. 1) 1924. Medical Section

*Pathogenesis of Purpura. M. R. Castex.—p. 509.
Chronic Trophedema (Meige). F. Rietti.—p. 520. Cont'd.
*Liver and Striatal Syndromes. M. La Torre.—p. 559.

Pathogenesis of Hemorrhagic Purpura.—Castex examined the spinal cord in two cases of purpura with a radicular distribution. He found grave changes in the spinal sympathetic centers. He believes that this may solve the pathogenesis of hemorrhagic conditions, as well as explain the origin of their various symptoms, such as thrombopenia, changes of bleeding and coagulation time and the condition of the walls of the blood vessels.

Liver and Striatal Syndromes.—La Torre points out that liver changes which had been considered pathognomonic of Wilson's disease, have been found also in Westphal-Strümpell's pseudosclerosis, in torsion spasm, and even in postencephalitic parkinsonian conditions. He concludes that all these affections of the striate body may have a common pathogenesis.

Riforma Medica, Naples

40: 937-960 (Oct. 6) 1924

Simplified Pavy Test for Sugar. S. Zisa.—p. 937.
Endothelioma of the Peritoneum. F. Russi.—p. 939.
Differentiating Lead-Acetate Agar Medium. E. M. Dandolo.—p. 942.
*Venesection in Sciatica. F. Viola.—p. 943.

Venesection in Sciatica.—Viola recommends large venesections in treatment of sciatica.

Brazil-Medico, Rio de Janeiro

2: 175-186 (Sept. 20) 1924

Antisepsis of Mouth Before and After Operations. A. Valerio.—p. 175.
Trifocal Eyeglasses. E. Campos.—p. 177.
*Unilateral Ptosis of Eyelid. Leal Junior.—p. 179.

Congenital Ptosis of Upper Lid.—Unilateral ptosis, as in the case described, is rare. When the mouth was opened wide, the eyelid was raised to its normal position.

Prensa Médica Argentina, Buenos Aires

11: 293-320 (Aug. 30) 1924

*Acidosis in Kidney Disease. M. R. Castex et al.—p. 293.
*Paroxysmal Tachycardia. G. Bosco.—p. 298.
*Unilateral Dilation of Pupil. E. Adrogué and M. Balado.—p. 301.
Lipomas of the Intestine. O. F. Mazzini.—p. 304.
Thumb and Entire Connected Tendon Torn Off. D. S. Cúneo.—p. 309.
*Hysterectomy for Chorio-Epithelioma. E. Pozzi and M. Mamone.—p. 310.

Acidosis in Course of Kidney Disease.—Castex and his co-workers applied parallel tests in four cases of chronic kidney disease. The findings confirmed the importance of the alkaline reserve in the blood for the prognosis in kidney disease. They confirmed also the ease and reliability of the Van Slyke technic. Reduction of the carbon dioxid content of the blood plasma seems to have the same significance for the prognosis as retention of urea.

Paroxysmal Tachycardia.—Bosco discusses both tachycardia occurring in volleys and in prolonged paroxysms, with extrasystoles, as revealing the generation of the heart impulse at abnormal points and times. He has encountered volleys of extrasystoles with various types of arrhythmia.

Dilatation of the Pupil from Intracranial Pressure.—Adrogué and Balado affirm from analysis of four cases that with permanent dilatation of one pupil, accompanying signs of intracranial pressure, the tumor, abscess or hematoma will be found in the hemisphere on the same side as the mydriasis. They assume the existence of a center for dilating the pupil, located in the hypothalamus, and suffering from the pressure of the excess of fluid in the ventricle.

Hysterectomy for Chorio-Epithelioma.—One of the two women had expelled a large hydatidiform mole two weeks before the chorio-epithelioma was discovered. The interval was three months in the other case, and hemorrhages had persisted after expulsion of the mole and curetting.

Repertorio, Bogota

15: 489-543, 1924

Acidosis in Bogota. G. Márquez.—p. 492.
Suggestions for Revision of Penal Code. J. D. Herrera.—p. 503.
*The Hookworm Campaign in Colombia. M. A. Cadena.—p. 510; E. Zapata.—p. 518.
*Asthma from Anaphylaxis. C. Trujillo Gutiérrez.—p. 529.

The Hookworm Campaign in Colombia.—Cadena reports on conditions and the work done at the Caldas dispensary organized for the treatment of hookworm. Zapata reports on the Santa Barbara dispensary. Each was kept open for three or four months. At the last mentioned station, treatment was given to 3,217 applicants, with 1,313 clinical cures. All the applicants examined had hookworm and also ascarids and trichocephalus, while amebiasis was common. Training the public in hygiene was an essential part of the work, state-wide propaganda being carried on from these two centers.

Asthma.—Trujillo Gutierrez' study of a case of severe asthma has convinced him that anaphylactic and colloidoclastic shocks entail the paroxysms of asthma by reflex action: The flocculated colloids irritate the afferent nerve fibers of the respiratory center, as a uterine tumor or nasal polyp might irritate those organs. This irritation, which occurs mainly in the lung region, owing to the exceptional area of capillary surface, entails clinical manifestations according to the intensity of the shock, the tonus of the parasympathetic nervous system at the moment, conditions in regard to the circulation through the lungs. In the man, aged 35, parenteral injection of milk induced an intense anaphylactic shock, terminating with an unprecedentedly severe paroxysm of asthma. He bore injections of other substances without an appreciable reaction.

Revista Médica del Uruguay, Montevideo

27: 253-288, 1924

*Pericarditis with Effusion. Barcia and Varela Fuentes.—p. 253.
*Syphilitic Gastric Ulcer. J. N. Quagliotti.—p. 263.
Disability from Trauma of Hand. J. May.—p. 270.

Pericarditis with Effusion.—The serial roentgenograms of the man, aged 44, with pericarditis simulating pleurisy show the recovery after release of 250 c.c. of fluid from the pericardium by way of the epigastrium. The heart action was so sluggish that the man was kept in bed for two months after the puncture, but then he recuperated completely. Before the puncture, the heart shadow showed a regular wave running across, like that in the fluid in a vessel when it is hit a blow. This coincided with the systole, and the pulse grew weaker during inspiration. The systolic pressure was 95 mm. at the close of expiration and only 80 mm. at the close of inspiration. The symptoms suggesting pleurisy subsided on change of position.

Recurring Syphilitic Gastric Ulcer.—The man recovered after a course of medical measures for the gastric ulcer diagnosed in 1919. The recurrence of symptoms the next year led to gastro-enterostomy. About a year later symptoms returned indicating ulceration at the new opening in the stomach. At this time the Wassermann reaction in blood and spinal fluid was positive for the first time and arsenical treatment was begun but had to be interrupted on several occasions owing to returning hematemesis and melena. A change to bismuth treatment was then made, and all the symptoms subsided. The patient has been free from disturbances during the two years since.

Semana Médica, Buenos Aires

2: 573-624 (Sept. 11) 1924

*Basal Metabolism in Obesity. G. Bosco.—p. 573.
Incomplete Form of Miliary Tuberculosis. J. R. Goyena.—p. 576.
*Phenol by the Vein in Tuberculosis. B. González Troncoso.—p. 580.
*The Bladder After Nephrectomy. N. M. Gaudino.—p. 582.
*Glycemia in Malignant Disease. Roffo and Rivarola.—p. 588.
Reflections on Medical Education. J. Pou Orfila.—p. 590.
Toxic Versus Infectious Rheumatism. S. Libarona Brian.—p. 605.
Pneumocystoscopy with Roentgenography. R. Landivar.—p. 607.
Medicolegal Case of Occupational Accident. P. B. Aquino.—p. 609.

The Basal Metabolism in Fröhlich's Syndrome.—Bosco relates that the basal metabolism was from 7 to 35 per cent. below normal in three boys and one girl between the ages of 10 and 14, belonging to two families. He says that the adiposity, genital atrophies, changes in the secondary sexual characters and development along the lines of the opposite sex forming this syndrome are explained by functional or organic changes in the vegetative centers of the hypothalamus region. These are the centers that preside over the metabolism of substances ingested, and morbid conditions in these centers distort the regular cycle of oxidations, and the substances ingested are deposited in the form of fat. The mechanism is much the same as in diabetes, only fat is produced to excess, instead of sugar, as in diabetes. By estimating the basal metabolism in cases of obesity, we can thus sift out those which belong in this Fröhlich group. The low basal metabolism shows profound disturbances in the centers concerned with growth and nutrition, and the outlook is not encouraging. This syndrome has nothing to do with functional derangement of the pituitary.

Phenol in Treatment of Tuberculosis.—González Troncoso charts the metabolic findings and other data from about fourteen patients being treated systematically with minute doses of phenol by the vein. They apparently all testify to general improvement of the condition and weight.

Tuberculous Cystitis After Nephrectomy.—Gaudino expatiates on the ease and efficacy of surgical diathermy applied to lesions in the bladder after removal of the tuberculous kidney. In the six cases described, the electrocoagulation was applied in five in from three to ten months after the nephrectomy, and the cure was realized with three to five sittings. In the sixth case, the interval had been six years and the disturbances from the bladder subsided after seven applications, notwithstanding the progressive pulmonary tuberculosis.

Glycemia in Malignant Disease.—Roffo and Rivarola state that cancer of long standing is always accompanied by hyperglycemia; the glycemia is normal with incipient cancer, and it drops below normal in cachexia.

Deutsche medizinische Wochenschrift, Berlin

50: 1357-1396 (Oct. 3) 1924

*Extrasystolia. F. Schultze.—p. 1357.
Ions and Metabolism. A. Bickel.—p. 1359. Cont'd.
*Tuberculosis in Emphysema. P. Hecht.—p. 1361.
*Hemolytic Jaundice. Seyderhelm.—p. 1362.
*Chronic Sepsis and Pernicious Anemia. G. Denecke.—p. 1364.
Fibrous Osteitis. P. Caan.—p. 1367.
*Semeiology of the Cerebrospinal Fluid. K. Eskuchen.—p. 1369.
*Active Substances of Corpus Luteum and Placenta. Fellner.—p. 1369.
*Sodium Cacodylate in Large Doses. E. Orbach.—p. 1371.
Complications of Gonorrhea. Ludwig v. Heiner.—p. 1373.
*Technic of Hecht Reaction. H. Hecht.—p. 1374.
*Birth Injury of Brain. P. Schwartz.—p. 1375.
Lime in Diarrhea. J. Saphra.—p. 1378.
Surgery of Retracted Nipples. E. Schepelmann.—p. 1378.
Homoplastic Transplantation of Ovary. E. Engel.—p. 1378.
Dyeing the Hair. M. Joseph.—p. 1379.
Progress in Research on Atoms. H. Küstner.—p. 1302, 1337, 1380.
Cancer and Endocrines. H. Elsner.—p. 1391. Conc'n.

Extrasystolia.—Schultze quotes Erb's self-observation. The famous clinician noticed premature heart-beats in himself when 29 years of age. This condition lasted for twenty-seven years, without impairing his mental or physical efficiency. After this he had for seven years attacks of tachycardia, which were disagreeable but did not disturb much his work or sport (mountain climbing). Subsequently he had only occasional premature beats, and when 70 years of age he survived a grave operation on his gallbladder, with febrile complications. He died at the age of 83 from an infectious enteritis. Thus an extrasystolic irregularity does not entail premature death.

Tuberculosis in Emphysema.—Hecht describes the clinical features of emphysema complicated with tuberculosis. The finding of tubercle bacilli in the sputum is not constant. Roentgen examination reveals the condition. The tuberculosis is usually benign. The speed of erythrocyte sedimentation is increased in the complication with tuberculosis, and is normal in simple emphysema.

Hemolytic Jaundice.—Seyderhelm deals with the symptoms and treatment of hemolytic icterus. The exacerbation may be provoked by various causes. He quotes Bürger's case of a student who became jaundiced after a compound fracture of the arm. The condition was diagnosed as sepsis and the arm was amputated, before the innocent nature of the jaundice was discovered. Splenectomy cures the majority of patients.

Chronic Sepsis and Pernicious Anemia.—Denecke reports on four cases of pernicious anemia with an infectious focus (cholecystitis, pyelitis or endocarditis).

Semeiology of the Cerebrospinal Fluid.—Eskuchen saw several instances of a positive colloidal gold reaction (especially in epidemic encephalitis) with negative Pándy reaction. He also found the paralysis curve comparatively often in multiple sclerosis.

Active Substances of Corpus Luteum and Placenta.—Fellner concludes that the corpus luteum and the placenta contain the same lipoid, which has a stimulating effect on the growth of the female sex organs—including the breast.

Large Doses of Sodium Cacodylate.—Orbach observed grave symptoms of poisoning (loss in weight, polyuria, thromboses) when using the extreme doses of sodium cacodylate as recommended by Rodriguez in postencephalitic parkinsonian conditions. He had good results with Henner's milder method (0.25 to 1 gm. of a 50 per cent. solution three times a week, intravenously, as reported in THE JOURNAL, March 10, 1923, p. 736).

Technic of Hecht Reaction.—Hecht describes a slight modification of his complement fixation test with active serum. The method gives a higher percentage of positive results, not only in syphilis but also in tuberculosis and gonorrhea.

Birth Injury of Brain.—Schwartz found in 65 per cent. of stillborn fetuses and infants less than 5 months of age, macroscopic changes in the brain, especially hemorrhages and patches of necrosis. He attributes them to an injury during the last stage of birth. The difference between the high intrapelvic and low atmospheric pressure may account for them. Spontaneous nystagmus is frequent in the new-born. A decreased irritability of the vestibular apparatus—similar to that occurring in adults after concussion of the brain—was found in many restless or apathetic infants. "Congenital debility" and "atrophy" should not be accused, according to Ylppö, as causes of death in the first month. The brain lesions suffered during labor usually account for it, as well as for porencephaly, epilepsy, idiocy and Little's disease. The pathology of the first month of life is completely dominated by the birth injuries of the brain.

Klinische Wochenschrift, Berlin

3: 1841-1888 (Oct. 7) 1924

Endocrines and the Skin. Pulvermacher.—p. 1841. Conc'n.
*Posture Reflexes in Man. H. Zingerle.—p. 1845.
*Titration of Thyroid Preparations. P. Freud and E. Nobel.—p. 1849.
*Diagnosis of Subarachnoid Block. K. Eskuchen.—p. 1851.
*Polycythemia. L. Beltz and E. Kaufmann.—p. 1855.
*Antianaphylactic Action of Mineral Waters. R. Cahn.—p. 1857.
*Insulin and Striated Muscle. R. Schaefer and F. Schmidt.—p. 1859.
*Blood Sugar During Exertion. Burger and Martens.—p. 1860.
*"Diabetes Refractory to Insulin." E. Basch.—p. 1861.
*Biliary Acids in Pregnancy. H. Kleesattel.—p. 1861.
*Electrolytes and Epinephrin. S. Leites.—p. 1862.
*Grave Pseudoparalytic Myasthenia. L. Tietz.—p. 1862.
Treatment of Tuberculosis. P. Jungmann.—p. 1863.
Blood Transfusions. H. Zielke.—p. 1868.

Posture Reflexes in Man.—Zingerle has been investigating the automatic changes of posture produced by a passive movement of the head or of an extremity in subjects reclining with closed eyes. He believes that this shows the possibility of examining subcortical reflexes.

Titration of Thyroid Preparations.—Freud and Nobel fed to guinea-pigs, of 220-250 gm. weight, 0.2 gm. of thyroid preparations daily. Preparations of average strength killed the animals in ten days.

Diagnosis of Spinal Subarachnoid Block.—Eskuchen supplements Queckenstedt's experiment with the combined suboccipital and lumbar puncture. Compression of the jugular veins is followed by an increase in the pressure of the lumbar fluid only when there is free communication between the upper and lower parts of the subarachnoid space. The pressure in the cisterna increases always. Simultaneous determination of the pressure at these two points makes the recognition of a complete blocking of this space more certain and allows a diagnosis even of a partial block. The combination with other methods (differences of constitution of the two fluids, impermeability for dyes and air injected into one of the needles) enable us to make a reliable diagnosis of the interrupted communication. The suboccipital puncture is of equal value with the lumbar, and of great importance for therapeutic lavage of the space. Deaths due to this puncture are rare if all precautions are observed. He injured the posterior cerebellar artery in one patient with tumor of the cerebellopontile angle. The patient recovered, probably because the communication upward was impeded.

Polycythemia.—Beltz and Kaufmann describe a case of polycythemia of the Vaquez type. The total blood volume was increased, but the total plasma was decreased. The concentration of plasma proteins was high. They recommend in such cases venesections followed by infusions of salt solutions.

Antianaphylactic Action of Mineral Waters.—Cahn confirms the preventive action of injections of Vichy water on

the anaphylactic shock. The action of the Fachingen and Ems water was not constant. He believes that the phenomenon is not due to the alkali.

Insulin and Striated Muscle.—Schaefer and Schmidt killed rabbits at the beginning of the insulin spasms. The extract from muscles was titrated for acid and alkaline valences. The quotient of these figures was lower than in controls, and did not reach the normal figures even when the muscles were boiled twenty-four hours after death. Muscles from animals killed by insulin gave still lower values, which scarcely increased at all on standing.

Blood Sugar During Exertion.—Burger and Martens point to the resemblance between the subjective disturbances after heavy physical exertion and those in hypoglycemia. Since other authors found a lowered blood sugar in some of the Marathon runners, they extended similar investigations to less strenuous exercise (run for one hour, fencing for fifty minutes). Two out of seven subjects became hypoglycemic—in one the blood sugar dropped from 0.09 to 0.061 per cent.

"Diabetes Refractory to Insulin."—Basch had been treating the patient mentioned by Falta (compare with abstract of Falta's article in these columns, Aug. 23, 1924, p. 651) also with insulin and had had no results. The patient became sugar-free after a course of Petrén's diet, similarly to another case which had been also refractory to insulin.

Biliary Acids in Pregnancy.—Kleesattel found a progressive increase of biliary acids in the urine and serum during pregnancy. The delivery causes a sudden decrease in the serum, which is soon followed by a new increase.

Electrolytes and Epinephrin.—Leites studied the action of epinephrin on the blood vessels of the surviving rabbit ear. Various electrolytes contained in the perfusing fluid had a great influence on the results.

Grave Pseudoparalytic Myasthenia.—Tietz describes a case of myasthenia gravis pseudoparalytica. Epinephrin relieved the condition. The patient died from erysipelas. Necropsy revealed an abnormal structure of the cortex of the suprarenals and an adenoma in the medulla of one of them.

Medizinische Klinik, Berlin

20: 1381-1416 (Oct. 5) 1924

*Insulin Treatment of Hepatargia. P. F. Richter.—p. 1381.
*Ultimate Outcome of Skin Grafts. W. Braun.—p. 1383.
Sex and Infectious Diseases. F. Schiff.—p. 1385.
*Subchronic Atrophy of the Liver. H. Lippmann.—p. 1390.
*Reconstruction of Joint Ligaments. M. Katzenstein.—p. 1392.
Apocynum in Heart Disease. E. Stadelmann.—p. 1395.
Unusual Foreign Bodies. M. Cohn.—p. 1396.
Gaucher's Splenomegaly. L. Pick.—p. 1399. Cont'd.
Obstetric Breviary. F. Eberhart.—p. 1402. Cont'n.
Preparations of Iron and Arsenic. Morawitz.—p. 1403.
Recent Works on Treatment of Nervous Diseases. K. Singer.—p. 1405.

Insulin Treatment of Hepatargia.—Richter gave daily infusions of insulin and glucose to a patient with acute yellow atrophy of the liver. The influence on the comatose condition was remarkable. The patient died, and the liver contained glycogen—contrary to other cases of acute yellow atrophy of the liver.

Ultimate Outcome of Skin Grafts.—Braun obtained permanent results with his technic, even where Thiersch's method failed. He introduces, slanting, small superficial grafts (4 or 5 square millimeters) about 3 or 4 mm. deep, into the granulation tissue. The best time for the grafting is two or three weeks after the injury. The after-treatment consists in daily dressings with physiologic sodium chlorid solution. Suppuration does not contraindicate this treatment.

Subchronic Atrophy of the Liver.—Lippmann diagnoses subchronic atrophy of the liver in young individuals with a rapidly developing jaundice and ascites, which is profuse and of low specific gravity and negative Rivalta reaction. Nevertheless any one of these symptoms—even jaundice—may be absent. The presence of leucin and tyrosin in the urine seems also to depend on the intensity of destruction of the liver.

Reconstruction of Joint Ligaments.—Katzenstein describes the plastic substitution of ligaments of joints with periosteum or skin.

Münchener medizinische Wochenschrift, Munich

71: 1381-1418 (Oct. 3) 1924

*Anatomy of Fractures of Neck of Femur. Schmorl.—p. 1381.
*The Sweat in Menstruation. O. Polano and K. Dietl.—p. 1385.
*Phlegmons and Their Treatment. R. Eden.—p. 1388.
*Absorption by Mucous Membranes. H. Bechhold.—p. 1391.
Microdetermination of Serum Calcium. F. Lebermann.—p. 1392.
Physical and Mental Development. H. Paull.—p. 1393.
Sedimentation Test in Surgery. Mensch.—p. 1396.
*Criminal Psychopaths. E. Wittermann.—p. 1397.
Three-Way Apparatus for Injections. E. Kaufmann.—p. 1401.
Urogenital Malformation. Seubert.—p. 1401.
Specific Treatment of Tuberculosis. K. H. Blümel.—p. 1402.
Roentgen Examination in Expert Testimony. Grashey.—p. 1404.
New Medical Examination Rules. H. W. Gruhle.—p. 1405.
Periods of Development of Medicine. G. Honigmann.—p. 1406.

Anatomy of Fractures of Neck of Femur.—Schmorl discusses the anatomic findings in thirty-two cases of fracture of the upper femur. He believes that senile osteoporosis is not due to arteriosclerosis. Interposition of folds of the capsule or of synovia prevented the healing in 75 per cent. of his cases.

The Sweat in Menstruation.—Polano and Dietl tested the influence of the kneading of a small batch of yeast dough on the fermentative activity of the yeast. They found always an increased or decreased speed of fermentation, if the women tested were menstruating at the time. No action was apparent during the intervals, not even with sweating hands. They believe that the action may be due to the higher cholin and creatinin content of the sweat during menstruation.

Phlegmons and Their Treatment.—Eden is skeptical with regard to various newer methods of treatment of phlegmons. He never saw any benefit from infiltration of the wound with germicidal fluids. Roentgen-ray treatment seems to help sometimes, especially in felons, but it fails in other cases. The basis of treatment is the knife.

Absorption by Mucous Membranes.—Bechhold determined the germicidal power of a few solutions before and after using them as a gargle. From the decrease of this power he figures that from 50 to 75 per cent. of the substance had been absorbed.

Criminal Psychopaths.—Wittermann declared only 17.5 per cent. of his criminal cases as insane, while his predecessors had so declared in 76 to 62 per cent. He also believes that a too rich inner life of the expert is a source of danger, because he tunes himself in too easily with the psychic condition of the delinquent. Only results are important, and the inhuman treatment of war hysteria had excellent effects. It also has thrown light on the nature of hysteria.

Zeitschrift für Tuberkulose, Leipzig

40: 481-542 (Sept.) 1924

*Collapse Treatment of Pulmonary Tuberculosis. O. Ziegler.—p. 485.
Ways and Means to Maintain the Fight Against Tuberculosis. G. Seiffert.—p. 510.

Operative Treatment of Pulmonary Tuberculosis.—Analyzing the four methods for immobilization of the lung, Ziegler points out that the induced pneumothorax and extrapleural thoracoplasty are the most effectual. The phrenicotomy may be considered as an adjuvant, while Baer's filling, for circumscribed cavities, is used only exceptionally. He believes that the indications are different in pneumothorax and thoracoplasty, but in doubtful cases the latter should be preferred. Of the 600 patients in the Heidehaus tuberculosis institution nearly 25 per cent. were submitted to operative treatment (phrenicotomy not included), and over 50 per cent. have been cured for ten years to date.

41: 1-80 (Sept.) 1924

*Reinfection in Tuberculosis. Ghon and Kudlich.—p. 1.
*Avian Tuberculosis in Man. E. Loewenstein.—p. 18.
Leukocyte Count in Prognosis of Tuberculosis. Kalkbrenner.—p. 25.
Defense of Organism Against Tuberculosis. E. Guth.—p. 39.
Case of Traumatic Tuberculosis. K. Terplan.—p. 44.
Tuberculosis in Schoolchildren, Prenzel and Arnold.—p. 51.
Sedimentation Test as Guide in Treatment of Tuberculosis. I. Mende.—p. 53.

Endogenous Reinfection from Tuberculous Gland.—Ghon and Kudlich report six cases of endogenous reinfection from exacerbation of a tuberculous process in some lymph gland at the hilum. They point out that this peculiar type of tuber-

culosis is not infrequent, and may induce an early hematogenous infection of the lungs in an organism otherwise free from tuberculosis.

Avian Tuberculosis in Man.—Loewenstein assumes that this kind of tuberculosis may be caused by feeding, as eggs of a tuberculous hen proved to contain the specific bacillus. Inoculations with an experimentally infected yolk showed the bacillus still alive in soft boiled eggs, but killed in the hard boiled. In two cited cases, the avian tuberculosis occurred in poultry breeders. Loewenstein believes that the bacillus may traverse the colon wall without causing local disturbances, and then localize in other organs. Of 459 birds dissected at the Zoological Garden, tuberculosis was manifest in 118, and avian tubercle bacilli have been found in hogs in Denmark. In tests it must be borne in mind that avian tubercle bacilli are not pathogenic for guinea pigs. This type of tuberculosis has a tendency to produce septicemia. The fever is high and may be continuous. There may be no sign of an affection of the lungs, but enlargement of the spleen is almost always present, and diagnostically misleading. The bone marrow and kidney are points of predilection. Erythremia and leukemia may occur with avian tuberculosis.

Zeitschrift für urologische Chirurgie, Berlin

16: 87-180 (Oct. 3) 1924

*Hematuria from Unknown Cause. P. Janssen.—p. 87.
*Diagnosis of Cancer of Prostate. K. Fischer.—p. 96.
Os Penis. M. Jacoby.—p. 102.
Diagnosis of Double Kidneys. E. Brecher.—p. 113.
Bilharziasis of the Bladder. R. T. Schwarzwald.—p. 117.
Operations on the Prepuce. E. Schepelmann.—p. 121.
*Catheterization of the Ureters. J. Goldberger.—p. 123.
Diverticulum at Ureter Mouth. A. Marsella.—p. 137.
*Sexual Functions After Prostatectomy. A. Lieschied.—p. 151.
Extracapsular Perirenal Hematoma. A. Rosenburg.—p. 155.
Complications of Nephrectomy. G. Nicolich.—p. 165.

Essential Hematuria.—Janssen reports one of the few cases in which ordinary examination of the entire kidney would have failed to reveal any cause for the left hematuria. The entire capsule was separated from the surface of the kidney by a layer of blood. Only minute histologic examination revealed congenital abnormalities in the walls of the arteries in the parenchyma, allowing diapedesis. Extravasation had probably been occurring since childhood, but the vague pains at times had not been heeded until the age of 19 when, after five days of intense pains and hematuria, the kidney was removed. The capsule seemed on the point of bursting.

Cancer of the Prostate.—The small primary cancer in the prostate had caused scarcely any symptoms but roentgenoscopy showed extensive metastatic light areas in the pelvic bones, explaining the "sciatica" and the early cachexia. This and two other cases described teach the importance of early removal of the prostate, even before retention occurs, when there is a sensation of oppression in the region and slight bleeding from the urethra. The microscope revealed cancer in one of the cases but only hard hyperplasia in the other.

Catheterization of the Ureters.—Goldberger charts the findings with ureter catheterization in eight healthy persons on a dry diet and again after profuse intake of fluid. The kidneys eliminated simultaneously about the same amount of chlorids and urea, but the water output varied within a wide range. The introduction of the catheter often sufficed to induce a reflex polyuria.

Sexual Functions After Prostatectomy.—Lieschied's investigation of fifty men who had had the prostate removed by Voelcker's method confirmed that the operation in itself had not affected the potentia coeundi unfavorably.

Zentralblatt für Chirurgie, Leipzig

51: 2007-2070 (Sept. 13) 1924

Plastic Construction of Ureter from Bladder. R. Demel.—p. 2008.
So-Called Hypertrophy of the Prostate. D. Kulenkampff.—p. 2011.
Basal Metabolism Test in the Surgical Clinic. Knipping.—p. 2014.
*Depression Fracture of the Zygomatic Arch. Lehmann.—p. 2016.
Case of Isolated Luxation of the Talus. G. Rechess.—p. 2017.
"Integral Therapy of Infected Wounds." Supplementary.—p. 2019.

Fracture of the Zygomatic Arch.—Lehmann reports that both his patients presented no external signs of fracture but only a flat circumscribed depression over the left zygomatic arch, just large enough to admit the tip of the finger. There was no discoloration of the soft parts. Tenderness was very slight. Both patients were suffering from trismus, due to the impingement on the temporal muscle by the depressed fragments. Under local anesthesia, a small incision was made at the upper margin of the zygomatic arch, to avoid the masseter and facial muscles. From this incision, entrance was effected with a lifter; a strong jerk, and the fracture was reduced. At this moment, the patient exclaimed, in both instances, "Now I can open my mouth." Reduction from the buccal cavity is not possible, since the temporal muscle blocks entrance.

51: 2071-2118 (Sept. 20) 1924

*Gastroscopy with Fatal Outcome. F. Sauerbruch.—p. 2071.
Nerve Grafting Versus Musculoplasty in Paralysis of the Facial Nerve. G. Perthes.—p. 2073.
Own Blood Infiltration, Followed by Incision to Wall off Furuncles, etc., on Face and Neck. Läwen.—p. 2076.
Frontal Access to Pituitary Body. M. Borchardt.—p. 2081.
"Hepato-Cholangiogastro- or Enterostomia." Tschassownikoff.—p. 2082.

Gastroscopy with Fatal Outcome.—Sauerbruch relates that Sternberg applied his gastroscopic procedure, in the presence of several surgeons, to a woman patient, in the knee-elbow position, as he recommends. In spite of repeated endeavors, gastroscopy was not effected. Sternberg was induced to give up the attempt. Within twelve hours the patient developed a severe mediastinitis, which forced Sauerbruch to expose the esophagus and to drain the mediastinal cavity. A severe suppurative retro-esophageal phlegmon was found. The patient died the day following, from the severe infection. Necropsy revealed in the upper portion of the esophagus, that the mucous membrane was intact, but the musculature was lacerated. The external layer of the esophagus was contused as by a blow. The region of the tonsils showed suggillations, apparently due to mechanical injuries caused by the introduction of the tube. Sauerbruch regards gastroscopy as more dangerous than exploratory laparotomy. Both Schindler and Sternberg have had other fatalities.

51: 2119-2182 (Sept. 27) 1924

*Wound Infections After Aseptic Operations. Teichert.—p. 2121.
*Division of Pylorus in Gastroduodenal Ulcer. Oehlecker.—p. 2125.
Etiology of Volvulus. B. Weksner.—p. 2129.
*"Ideal" Prostatectomy. G. Mertens.—p. 2130.
*Special Tampon for Suprapubic Prostatectomy. Bouvier.—p. 2131.
Operation for Rectal Fistula. A. Frank.—p. 2133.
Reenforcing Material for Plaster Dressings. Hilarowicz.—p. 2133.
Schanz' Nail Extension in Genu Valgum and Varum. Riedel.—p. 2134.
Forceps for Adjusting Deviated Nasal Septum. Eysell.—p. 2135.

Wound Infections After Aseptic Operations, with Primary Closure.—In the Königsberg surgical clinic, in 1922, forty-two infections (3.12 per cent.) occurred after 1,347 aseptic operations, and in 1923, 1.33 per cent. of 1,349. The infections did not develop after any particular type of operation, suturing material, or form of anesthesia. When several operations in a day were performed, the later operations were more likely to develop infections. Wound infections developed usually on the sixth to eighth day; in a few cases at the end of the second week, and in one case after thirty days. The causative agent was always the staphylococcus. The length of the operation did not increase materially the danger of infection. The women's ward had the fewest infections. Of the fifteen surgeons who performed operations in the clinic, all had about the same proportion of infections; the prophylactic measures were the same throughout the hospital. Teichert was unable to find in the literature corresponding data from other hospitals, and cannot state whether this average of 2.23 per cent. infections after 2,696 aseptic operations is above or below the record elsewhere. He thinks, however, that more statistics would give a more definite direction to our endeavors to ward off infections.

Division of the Pylorus in Gastroduodenal Ulcer.—For ulcer near the pylorus, when resection is contraindicated, and it seems desirable to avoid gastro-enterostomy, Oehlecker recommends gastroduodenostomy with division of the pylorus. This procedure has given good results, in many cases, the patients becoming rid of their symptoms. This Finney operation is not so radical as resection. He thinks that in many cases in which gastro-enterostomy is now performed, gastroduodenostomy, together with division of the pylorus, may be

employed to advantage. Oehlecker describes his technic in detail.

"Ideal" Prostatectomy.—Mertens advises primary suturing of the wound in the posterior bladder wall resulting from the enucleation of the prostate, whereby conditions in the bladder are restored to normal, as far as possible. He reports four cases in which he recently applied primary suturing with excellent results. In two cases, the operative field was clearly visible. The urine became free from blood much sooner than in former prostatectomy cases. Evacuation of urine was undisturbed from the day of the operation, though a catheter was inserted two days for a few hours. Continence was restored with unusual rapidity because the internal sphincter is brought into its correct position by the suture and because the primary suture of the anterior and posterior bladder wound restores at once normal pressure conditions in the bladder.

Special Tampon for Suprapubic Prostatectomy.—Bouvier describes a tampon that he has found efficacious in combating serious hemorrhage. He uses a six-ply strip of gauze from 4 to 6 cm. wide. Beginning at one end of the strip, which is from 25 to 30 cm. long or longer, a wire is passed in and out through the full thickness of the gauze strip, lengthwise, like a basting thread, the entire length of the strip. In case of serious hemorrhage after prostatectomy, the unknotted end of the wire is tied to a catheter or sound passed up through the urethra. As the wire is drawn upon, the strip is pulled together in accordion-like layers, thus tamponing the wound cavity.

Zentralblatt für Gynäkologie, Leipzig

48: 2217-2280 (Oct. 11) 1924

*Joint Disease and Ovary Functioning. J. Novak.—p. 2218.
Delivery of Abnormally Large Fetus in Normal Pelvis. Baer.—p. 2221.
*Bilateral Tubal Pregnancy. H. Schreiber.—p. 2224.
Inflammatory Tumor in Great Omentum. F. Zeller.—p. 2226.
Treatment of Injuries of Parametrium from Induced Abortion. A. Streibel.—p. 2229.
*Intracardiac Injection in the New-Born. E. A. Koch.—p. 2234.
"Cesarean Section in Eclampsia." A. Wagner.—p. 2238.

Arthritis Deformans and Ovary Functioning.—Novak noted joint disturbances in a case of cancer of the cervix which was successfully treated with radium. The same as in Menge's cases, swelling and severe pains appeared in various large joints. A subfascial grafting of an ovary in the region of the rectus muscle relieved the pains only for several months. Similar disturbances have been observed in many women at the time of the menopause. Novak is inclined to consider the lack of ovarian functioning as the chief cause in ostearthrosis deformans. He relates that the connection of joint disorders with the genital organs was noted even in Greek and Roman literature.

Simultaneous Pregnancy in Both Tubes.—The necropsy and histologic findings in Schreiber's case showed that the two ova apparently belonged to one ovary, and were simultaneously impregnated.

Resuscitation of the New-Born by Intracardiac Injection.—Koch reports a case of successful intracardiac injection of epinephrin in an asphyxiated new-born infant, five or six minutes after the heart stopped beating. He believes that no result can be expected later than ten minutes, and no more than 0.5 c.c. of the 1:1,000 solution should be used in the new-born.

Casopis lekaruv ceskych, Prague

63: 1441-1476 (Oct. 4) 1924

Treatment of Gastric Ulcer. V. Maydl.—p. 1441. Cont'n.
Nonspecificity of Tebecin. V. Dvorsky.—p. 1444.
*Hernia of Uterus and Adnexa. G. Müller.—p. 1447. Conc'n.
*Three Neurologic Affections in One Family. Henner.—p. 1451. Conc'n.
Denervation of the Kidneys. K. Neuwirt.—p. 1454. Begun, p. 1337.
*Tuberculosis of Lower Vertebrae. F. Smoler.—p. 1461.
Quincke's Edema. J. Babicek.—p. 1461. Begun, p. 1419.
Treatment of Adnexitis. J. Jerie.—p. 1463. Cont'n.

Hernia of Uterus and Adnexa.—Müller describes several cases of rare combinations of hernia of the uterus, tube and ovary. The congenital basis of these affections was evident also in the presence of malformations of these organs. Fetal inflammation—especially of syphilitic origin—might have been the cause.

Three Neurologic Affections in One Family.—Henner describes three different affections in one family: The mother had a spastic paraplegia from multiple sclerosis. A pseudohypertrophic dystrophy of muscles, of the Duchenne type, developed in the daughter at the age of 19, and the son has an atypical myopathy resembling the Leyden type. Henner observed in the mother a crossed reflex of outward rotation and abduction of the lower extremity. He believes it inadvisable to introduce such reflexes immediately into semeiology.

Tuberculosis of Lower Vertebrae.—Albee's operation is impossible in tuberculosis of the lumbar vertebrae. Smoler used Schultz' recent modification for this purpose, and reports good results in two cases.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

2: 1691-1822 (Oct. 4) 1924

Immunization Against Diphtheria. H. Aldershoff.—p. 1693.
*Reaction of Blood to Roentgen Irradiation. D. den Hoed.—p. 1707.
Vital Staining of Eyes and Eyelids. E. Marx.—p. 1715.
Pentosuria in Lactating Woman with Furunculosis. Sohlberg.—p. 1722.
Cutis Verticis Gyrata. M. Nijkerk.—p. 1724.
W. Piso, a Pioneer in Tropical Medicine, 1648. Van Andel.—p. 1731.
Thomas Sydenham, 1624. F. M. G. de Feijfer.—p. 1747.

Reaction of the Blood to Roentgen Irradiation.—Den Hoed insists that roentgen-ray treatment of cancer involves biology more than physics. The exposure is followed by high leukocytosis, but the leukocyte count then drops to far below normal. In a few instances there was no initial rise. This extreme leukopenia warns not to repeat the exposure until the blood count has returned approximately to normal.

2: 1823-1954 (Oct. 11) 1924

*Vesicular Mole. J. A. van Dongen.—p. 1824.
*Malignant Suprarenal Tumors. C. van Dam.—p. 1846.
Adipocire. C. W. G. Mieremet.—p. 1857.
*Recurrence of Measles. H. W. Berinsohn.—p. 1864.
Rheumatoid Tuberculosis in Shoulder. E. Roselaar.—p. 1865.
*Heat Stroke with Unusual Course. D. van der Kooi.—p. 1868.

Hydatidiform Mole.—Van Dongen has encountered sixteen cases in seven years. Only one of the women was over 40, and eleven were under 30. In six of the cases there were accompanying bilateral ovarian cysts; but these cysts all retrogressed completely in three to eight weeks after removal of the mole. There was no spontaneous expulsion in any instance. One patient died, but ten of the others have passed through one or more normal pregnancies since. Consequently he relies exclusively on polyps forceps and the curet, with hysterectomy only if symptoms later indicate the development of a chorio-epithelioma. There were no signs of this in any of his cases.

Suprarenal Tumors.—Van Dam summarizes from the literature, with illustrations, six cases of a suprarenal cancer in children, aged 3 to 18. He then describes two personally observed cases of suprarenal neuroblastoma, one with metastasis predominantly in the liver (Pepper type); in the skull in the other (Hutchinson type), with photomicrographs. He compares the findings with the few similar cases on record.

Reinfection with Measles.—Berinsohn has found recurrence of measles recorded in 5 per cent. of eighty infants; in 2.2 per cent. of 314 children, aged from 1 to 3, and in 1.2 per cent. of 415 between 4 and 7, and none above this age.

Heat Stroke.—Van der Kooi's patient had been haying all day when he fell unconscious, with Cheyne-Stokes breathing and convulsions. He was relieved by venesection and caffein, but symptoms of meningitis developed, with deafness and blood clots in the vitreous humor, entailing blindness. All the symptoms gradually subsided except the blindness. Attempts to remove the blood clots in the eye led to loss of one eye, but the clots in the other eye were finally spontaneously absorbed by the end of the year.

Correction

Metastasis Rare with Cancer of the Esophagus.—In Blauwkuip's study of cancer of the esophagus, summarized in these columns, Oct. 18, 1924, page 1284, the correct reading is: "In the 125 esophagus cancer cadavers, in 80 no metastases were found in remote organs, and there was no evidence of involvement of the glands in 59." The abstract incorrectly stated the opposite.